# MODERN October, 1947 MOCINE Shop October, 1947 Table of Contents Page 5

Choice NORMATH & FRINCE OKMA TO BEAR HOS . LONGER LIFE

ORMA-HOFFMANN BEARINGS CORP'N, STAMFORD, CONN., FOUNDED 1911



George EURTON MACHINE CO.

Tracer Controlled Milling 1710 RACINE STREET . RACINE, WISCONSIN, U.S.A.



18



## How to keep a center drive on center

VIHEN a center drive is mounted on Timken tapered roller bearings you know you've got precision-and can keep it.

Timken bearings hold spindles rigid carry the weight of the work and keep it revolving accurately. Their tapered construction permits accurate preloading to any desired degree and carries radial and thrust loads without deflection or end-movement.

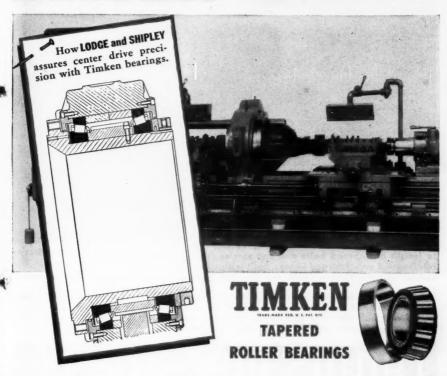
The rolls and races of Timken bearings are made of Timken fine alloy steel -hardened to give you a combination of load-carrying toughness and wearresisting hardness. The line contact between rolls and races distributes the load over a wide area; greater loads can be carried with practically no wear.

Because Timken bearings are manufactured to extreme precision, and finished to almost incredible smoothness. friction is eliminated.

Remember, no other bearing can bring you all the advantages you get with Timken tapered roller bearingsbacked by 49 years of bearing research and development. Be sure you have them in the machine tools you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio.



This symbol on a product means its bearings are the best.



NOT JUST A BALL 🔾 NOT JUST A ROLLER 🖙 THE TIMKEN TAPERED ROLLER 🖙 DEARING TAKES RADIAL 🛈 AND THRUST 🗝 – 🛈 – LOADS OR ANY COMBINATION





 The LANDIS Automatic Forming and Threading Machine is fully-automatic and designed to point to length and thread bolts and cap screws from cold headed or hot forged blanks. Built with semi-

**Automatic Forming & Threading Machine** 

vertical spindles to save space, one man can easily service a battery of eight machines.

Bolt blanks are dumped continuously into the hopper. The operation is then automatic until the finished bolts are ejected. Short set-up time is ideal for short runs. Output varies with bolt diameter and thread length—786  $\frac{5}{8}$ " bolts in one hour, over 1,000 7/16" 20 pitch N.F. cap screws of alloy steel to Class 3 specifications in one hour.

LANDIS MACHINE CO.

# A **NEW** HEALD BORE-MATIC

FOR MEDIUM TO LARGE SIZE WORK



THE NEW medium-large Heald Bore-Matic handles a wide variety of work...in single or multiple machining operations...including rough and finish boring, turning, facing, chamfering, grooving, or fly cutting.

Here are a few of its outstanding features which make

for high production and low maintenance: GREATER POWER AND HIGHER SPEEDS EXTREMELY FAST OPERATING CYCLE TWO-WAY BORING UNIFORM HYDRAULIC FEEDS INSTANTANEOUS BRAKE TIMING PERMANENTLY LUBRICATED BORINGHEADS

ISOLATED, DETACHABLE POWER UNIT

Get further information on this and other remarkable new Heald machines at the Heald branch office nearest you, or write: SEND FOR BULLETIN on new Heald 221-321 Single-End or No. 222-322 Double-End Bore-Matic. Lists applications, features, specifications.

## HEALD

means more precision
...less cost

Internal and Surface Grinding Machines • • • Bore-Matic Precision Finishing Machines



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ur.

THE HEALD MACHINE COMPANY, Worcester 6, Mass.

Branch Offices in Chicago · Cleveland · Dayton · Detroit · Indianapolis · Lansing · New York



You can SEE the extra load capacity of a Farrel Speed Reducer

When you look under the cover of a Farrel speed reducer, you see gears that have backbones instead of the useless center grooves found in some herringbone gears. This backbone, formed where the helices meet to make the teeth continuous across the face, puts the entire width of the gear to work, providing greater capacity to withstand shocks, stresses and heavy loads.

Precision generated by the famous Farrel-Sykes process, the *Gear with a Backbone* is widely known throughout industry for its smooth, quiet, efficient operation.

Other features of these speed reducers include dust proof, heavy section housings that hold rotating elements in original, precise alignment, and rigid and accurately ground shafts properly mounted in roller bearings.

Farrel speed reducers are available in a wide range of sizes and capacities. Write for descriptive bulletins.

## FARREL-BIRMINGHAM COMPANY, INC. 344 VULCAN ST., BUFFALO 7, N. Y.

Plants: Ansonia and Derby, Conn., Buffalo, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh,
Akron, Chicago, Los Angeles, Tulsa, Houston



Farrel-Birmingham

FB-410

VOLUME 20 NUMBER 5 OCTOBER, 1947

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# Médine Shop outents

By C. H. ELLIOTT
The Rubber Die Press as a Tool for Forming Aluminum 144 By E. R. YARHAM
Lapped Tools Do a Better Job!
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CORRECTLY hardened under modern scientific control and then finished after hardening by the exclusive HANSON PROCESS, these taps are truly Precision Tools. That is why they cut clean, accurate threads, deliver an extra amount of work between grinds

and stand up to the limit on tough jobs.

Result: Lower cost per tapped hole, and good reasons why you should use Hanson-Whitney Taps.

Our engineers would welcome the opportunity to study your tapping problems — write today.



# -We've made the "ROUNDS" for 60 years

Perhaps OUR experience can help YOU!

Yes, for more than a half century, Gisholt has specialized in the field of round and partly round parts . . . building equipment to produce them ... helping others to use it most efficiently.

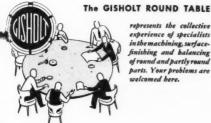
Gisholt engineers concentrate on these machine shop problems, visiting hundreds of plants each year to help solve hundreds of problems. They will gladly help you.

If you have operations in your plant which you think might be improved, we invite you to make use of this experience through the Gisholt Round Table-a clearing house for practical ideas.

Now, and in the years ahead, more emphasis than ever will be placed upon better methods, increased efficiency and lower costs. Be sure you have the best methods and equipment. It pays to "Look ahead-keep ahead-with Gisholt."

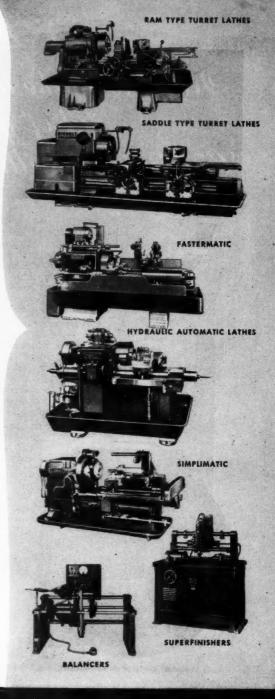
#### GISHOLT MACHINE COMPANY

Madison 3, Wisconsin



represents the collective experience of specialists in the machining, surfacefinishing and balancing of round and partly round parts. Your problems are

welcomed bere.



# Want to make a Die Sinker out of your Cincinnati Milling Machine?

It can readily be done with CINCINNATI'S new High Speed Vertical Milling Attachment and Automatic Depth Control Attachment for CINCINNATI Nos. 2 MI and ML Milling Machines. These attachments quickly convert a general purpose milling machine into a highly efficient tracer controlled vertical miller for the rapid and economical production of plastic molds, permanent molds, metal patterns, die casting dies, and small drop-forging dies. Here's what you get:

A tracer control for the reproduction of dies.

 A self-contained, swivel head, high speed vertical milling attachment having its own motor drive for the spindle.

Ten spindle speeds, ranging from 225 to 4000 rpm.

 One single bolt disconnects the tracer mechanism to permit conventional vertical milling operations.

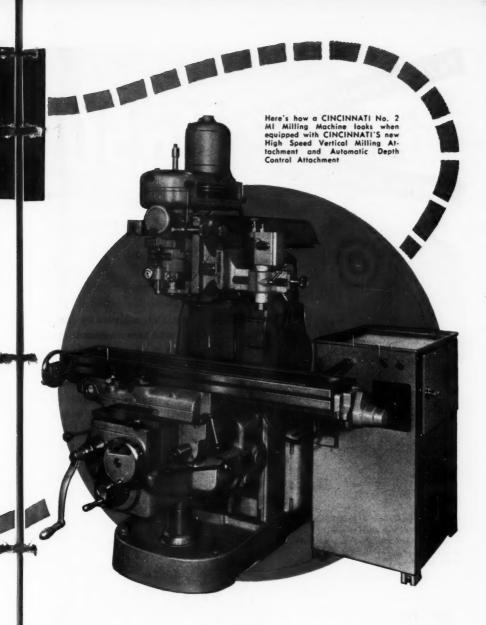
An adjustable dial indicator depth gage for accurate visual indication of vertical cutter adjustments.

Thus you may use your CINCINNATI No. 2 MI or ML as a die sinker, as a vertical miller, or as a horizontal miller. Investigate. Complete details may be obtained by writing for literature



CINCINNATI No. 2 MI Plain Milling Machine. Catalog M-1506 contains complete specifications.





# THE CINCINNATI MILLING MACHINE CO.

MILLING MACHINES . BROACHING MACHINES . CUTTER SHARPENING MACHINES

Fast Accurate Production

More Economically

More Economically

PRECISION BORING an
VERTICAL MILLING
MACHINE



The unusual production economy of the new Knight No. 50 is achieved by combining, in a single solid base machine of exceptional range, all the features required for both precision boring and vertical milling. The elimination of time-wasting extra setups and transfers of work save costly labor and make possible much higher output at far lower costs. With a working capacity of greater range than other machines of comparable size, there is also power to spare in the rugged No. 50 for easily and speedily handling the toughest jobs in any shop.

- 16 Spindle speeds from 40 to 2000 r.p.m.
- 9 Spindle feed from .005" to .010"
- 100" per minute table traverse, both directions
- 16 Table feeds, 5/16" to 20" per minute
- 71/2 H. P. drive

Write Today for Catalog Information

W.B.KNIGHT



MACHINERY COMPANY

MORE GOODS for MORE PEOPLE at LOWER COST

3920 WEST PINE BLVD. • ST. LOUIS 8, MISSOURI

For Mass-Produced GEARS

Progressive simultaneous generating of six blanks...planeting around a giant 16-inch reciprocating cutter... affords amazing production of external gears within its capacity range. Write for a bulletin on the Planetary Gear Shaper.



THE FELLOWS GEAR SHAPER CO., HEAD OFFICE AND EXPORT DEPT., SPRINGFIELD, VERMONT. BRANCH OFFICES: 616 FISHER BLDG., DETROIT 2 • 640 WEST TOWN OFFICE BLDG., CHICAGO 12 • 7706 EMPIRE STATE BLDG., NEW YORK I

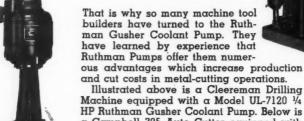
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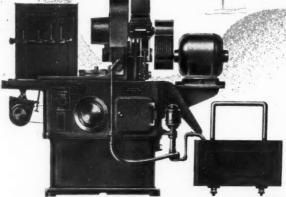
# Your Coolant System is no better than the Pump that controls it



HP Ruthman Gusher Coolant Pump. Below is a Campbell 725 Auto Cutter equipped with a Model YLO-7160 1/4 HP-1725 RPM Ruthman Gusher Coolant Pump.

Write for Catalog 10-F

# THE\_RUTHMAN MACHINERY CO.



Photos Courtesy:
Bryant Machinery &
Engineering Co.
Chicago, Ill.
American Chain &
Cable Co.
Bridgeport, Conn.

1817 READING ROAD

CINCINNATI, OHIO

October, 1947

# "Its Precision Machining Satisfies Our Closest Tolerance Requirements!"



5 sizes-18"to 36"

ERIOR OIL TOOL CO.

Small, 18" up to 7-1/8" Hole Medium, 24" up to 12-1/8" Hole Large, 27" up to 13-1/8" Hole Large, 30" up to 14-1/8" Hole Large, 36" up to 16/1-2" Hole

Standard Type lathes, 16" to 36"

# ydratrol

HE SUPERIOR OIL TOOL CO., Santa Fe Springs, Calif., recently wrote us: "Since its installation, 2½ years ago, our 27" Hydratrol Lathe has been operating 2 shifts per day, 6 days a week, cutting tapered tool joints in Drill Collars.

"These Drill Collars are 40 ft. long and 4½ to 10" in diameter. Frequently as many as 6 are screwed together to run directly above the drilling bit in a drill pipe string; therefore, accurately machined joints are a 'must'.

"Many of the Oil Companies maintain their own joint inspection departments, equipped with precision instruments to check lead, taper and fit, to insure against failure in operation and costly fishing jobs. We have been able to satisfy their closest tolerance requirements on tool joints and have an increasing clientele as a result.

"The rapid traverse attachment on this machine is a very desirable feature. The lathe is easy to operate due to its clutch control system. But the principal feature that recommends the HYDRATROL is its ability to hold close precision

on taper joint work. That's why the

inspectors from our Oil Company

clients are our biggest boosters.

#### MOVIE SOUND FILM

in natural color, available, showing features and functions of Hydratrol Lathes, machines in operation, etc. . Ask our representative about a showing.

Send prints for a specific recommendation for YOUR shop.

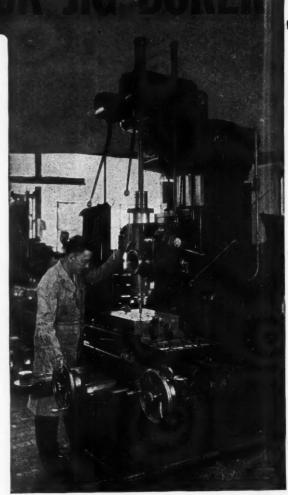
# INSNICK HG BORER

On particularly close tolerance work, such as making the die illustrated, Fosdick Jig Borers are demonstrating their ability to meet the exceptional accuracy demanded in hundreds of tool rooms and tool and die shops.

The machine is exceptionally rigid—for example the bed of rugged construction is heavily ribbed to avoid distortion. A three point bearing serves for leveling and maintains perfect alignment. A sturdy sliding head supports spindle close to the work.

Operation is also very simple. All controls are centralized for ease of control. Twelve speeds in geometrical progression from 60 to 1500 RPM are instantly obtained through a single lever. Nine feeds from .00125 inch to .010 inch are available through a single control lever with direct reading index.

Thus the Fosdick Jig Borer offers all the advantages of high priced precision machines at a comparatively low cost. If you have a precision drilling —boring—facing or even light milling operation—put it on a Fosdick for speed — accuracy and low cost.



A full descriptive bulletin is available—ask for Fosdick Jig Borer Bulletin M.S.J.

**FOSDICK** 

MACHINE TOOL CO. CINCINNATI 23, OHIO

# Tops in Tapping

# Aarvis TORQOMATIC

The new torque-driven tapper is the most modern, efficient and productive tool of its kind on the market. Performance in your shop will confirm this fact. The Torgomatic is ultra-sensitive, will tap from soap to nickel steel with finger tip pressure. It increases number of tapped holes per hour, adds life to taps and is a new pleasure for the operator. Available in standard and built-in models.

Write for fully descriptive Catalog TMT-1. A Jarvis representative will welcome the opportunity to demonstrate the Torgomatic.

# Garvis Dowding TAPS

For maximum performance under tapping canditions prevailing in your shop, make your next tap order read "Jarvis-Dowding" custom finished taps, designed to meet your demands. "Jarvis-Dowding" Taps cut more threads with less power, require minimum sharpening and provide greater dependability on the job.

Write for Bulletin JD-101 for more details.

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT

- Rotary Files Flexible Shaft Machines
- Taps and Dies

Quick Change Collets and Chucks

# CRACK DOWN ON-

# with the high-production flexibility of the Delta\* 17" Drill Press

Versatile Delta Drill Presses give you low-cost, troublefree capacity for a wide variety of operations and set-ups

You can use a low-cost Delta 17" Drill Press (single or multiple spindles) in dozens of operations in almost any plant. And wherever you use a Delta, you can count on increased production—at lower costs! That has been the experience of The Dumore Company, Racine, Wisconsin, manufacturer of precision tools and grinders—and it has been the experience of hundreds of other plants as well.

At Dumore, nearly 100 Delta Drill Presses are used for drilling, tapping, burring, spot-facing, and a variety of other jobs. Dumore's ingenious Delta set-ups suggest ways you can streamline your plant operations for lower costs.

The Delta 17" Drill Press is engineered for accurate, fast production, and long,

dependable service. Outstanding design and construction features give you exceptional value: Extremely accurate spindle with an exceptionally long bearing surface of spline to eliminate wear and retain original accuracy... pulley mounted on lubricated-for-life ball bearings... head- and table-raising mechanisms equipped with ball bearings... close-tolerance table surfaces... heavy construction throughout, with advanced design for correct weight distribution.

Send for a free copy of Bulletin A-17 today. Use the coupon below. Or ask your Delta distributor for further details on Delta 17" Drill Presses. Your distributor is listed under "Tools" in the classified section of your telephone directory.





# Fast-Accurate Durable

TAKE A LOOK at what the "RPMster" can do for your shop!

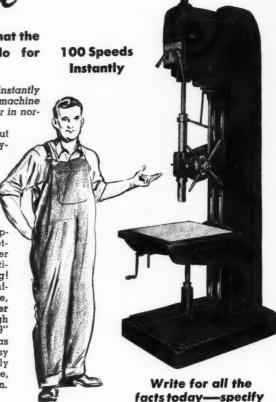
Speeds are changed instantly with one hand — with machine running — with operator in normal working position!

Think how this can cut costs and send output skyrocketing in drilling, tapping, spotfacing, counter-boring, hollow milling
and other operations! Using quickchange chucks, op-

erator can do several operations on the same setup - choosing the proper speed for each - practically without hesitating! Besides this famous Buffalo Variable Speed Drive, you have 27" space under the spindle nose—enough for 95% of the work. 99" high, the "RPMster" has all controls within easy reach, and is of typically rugged, simple, accurate, trouble-free construction. Up to 11/2" drilling capacity, in cast iron.

388 Broadway

18



BUILETIN 3257.

BUILETIN 3257.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



YOU

Buffalo, N. Y.

## Now a new

# le Spindle Automatic

by WARNER & SWASEY



usive, patented "Quick-Set hanism". This eliminates need cams. Work stroke settings are by quick, simple adjustment graduated quadrant. The fast geover makes it practical and itable to use Warner & Swasey matics for small, medium og runs.

maximum visibility to work piece and chuck, generous chip clearance and disposal, extra large coolant capacity.

Swing over cross slide, 81/2" Diameter. Swing under turret bar, 10" Diameter.

To get full, up to the minute information on the latest developments in Warner & Swasey

TURRET LATHES AUTOMATIC CHUCKING AND BAR MACHINES PRECISION TAPPING AND THREADING MACHINES CHUCKS AND TURNING TOOLS AND ACCESSORIES

call in the Warner & Swasey field representative or write Warner & Swasey, Cleveland.

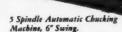
WARNER

SWASEY Machine Tools



r Machine, 14" "Standard" city; 21/4" oversized capacity.

1947



YOU CAN MACHINE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY



Screwdriver Bits

THE APEX MACHINE & TOOL CO., 1028 S. Patterson Blvd., Dayton 2, Ohio

Safety Friction Tapping Chucks; Quick Change and Positive Drive Drill Chucks; Vertical Float Tapping Chucks; Parallel Floating Tool Holders; Power Bits for Phillips, Slotted Head, Frearson and Clutch Head Screws; Hand Drivers for Phillips and Clutch Head Screws; Aircraft, Industrial Universal Joints; Sockets and Universal Joint Socket Wrenches,

20



Rotating and

**Non-Rotating Cylinders** 

(Air and Hydraulic)

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947

ROTATING Job right.

Used wherever there is a need for controlled push-pull-lift or lowering action. You get fast, smooth dependable power that does the

NON-ROTATING

f. Tapered cam arrangement on level ends, amplify gripping force and previde locking means. 2. Steel body cored to reduce weight — minimizes spindle strain. 3. Dust-proof bushing prevents dust and chips from interfering with moving parts. 4. Hardened and ground master-jaws are made to ASA specifications. 5. Hardened alloy furum pins. 6. Tapered recess for mounting to all standard ASA tapered spindles.

Other ANKER-HOLTH products include Air Pressure Regulating Valves, Hand and Foot-Operated Air Control Valves, Air Operated Collets, Arbors, Expanding Mandrels, Adjustable and Compensating Chucks, Lubricator Assemblies, Drill Press Chuck and Cylinder Combinations, Special Chucks and Cylinders.

Anker-Holth

Established 1904

2731 Conner Street . Port Huron, Michigan

# Avey Automatic

# METHOD No. 8



No. 1 Size — 1/2" capacity in cast iron.

No. 2 Size - 7/8" capacity in cast iron.

Designed for DEEP HOLE DRILLING
— (step method) — using rotating table—each station drilling an additional depth. Number of station required depends on depth to be drilled.

Deep hole drilled in time required to drill onefifth of depth — free loading time and five times single spindle production.

METHOD No. 8—Higher production, straighter hole, better chip and coolant condition—high quality work obtained speedily, efficiently with a minimum of supervision.

Send for Englineering Bulletin No. 645.

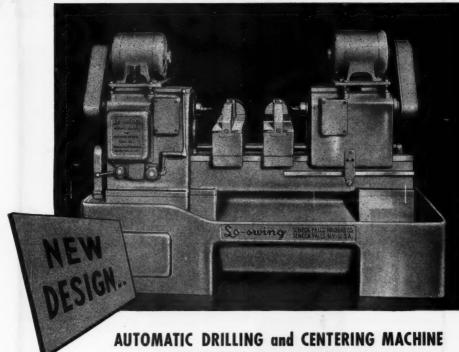
THE AVEY DRILLING MACHINE CO.



avey

# CHINE OF THE MONT

PREPARED BY THE SENECA FALLS MACHINE CO. "THE So-owing PEOPLE" SENECA FALLS, NEW YORK



# has BUILT-IN RAPID TRAVERSE MECHANISM

• We are proud to present the new Model "CS" Automatic Drilling and Centering Machine designed for fast operation on mass production work and equipped with quick change-over features for short-run jobs. Speeds and feeds are quickly changed through the use of standard pick-off gears, and a built-in adjustable rapid traverse mechanism reduces automatic cycle time to a strict minimum.

Two independent, motor-driven heads permit operation at correct spindle speeds for each head when different sized drills or combination countersinks are used. The drilling spindles are cam operated and pos-itive in action. The cams will operate for any depth of cut within the capacity of the machine and do not require changing.

The rapid traverse mechanism for both centering

heads is controlled by cams which are pre-set to a graduated dial, doing away with inefficient "set and try" methods.

Standard, quick-acting, equalizing, air-operated vises are available and may be arranged to operate singly or in pairs. Ample distance from the bed to the spindle provides sufficient room for special work-holding fix-tures which are available as extra equipment. Electric motors are the standard foot mounting type and may be furnished in sizes from 1 to 3 H.P.

The Model "CS" Automatic Centering Machine is manufactured in four standard sizes, 18", 42", 66" and 90" between drills. This new addition to the Lo-swing Line of cost-cutting production equipment was shown for the first time at the Chicago Machine Tool Show.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH So-swings

Consult

# **MORRIS**

FOR MACHINES TO MEET SPECIAL JOB REQUIREMENTS

Morris engineers designed and constructed this vertical machine with twelve spindle head for reaming cylinder block. The machine is equipped with three position hydraulically operated come-along device.

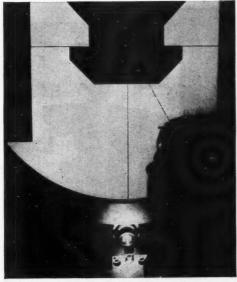
It is also equipped with a hydraulically operated clamping fixture and hydraulic feed to vertical head for reaming automotive block valve guide holes.

The Morris organization has the engineering "know how" and shop facilities to design, develop and install high production equipment to meet special job requirements. Consult Morris for high production jobs.





# Assured Accuracy.



PHOTOGRAPH Courtesy The Elliott Company, Jeannette, Pa.

THE dovetail shanks of steam turbine blades and many other turbine components are inspected easily and quickly on Jones & Lamson Optical Comparators. By any other means inspection would be a slow and costly process.

Jones & Lamson Optical Comparators provide a rapid and extremely accurate method for inspecting even th. most complex forms.

Our engineers are inspection specialists; their knowledge of holding fixtures, handling methods and suitable Comparator equipment has saved thousands of dollars in manufacturing plants throughout the country.

Call, write or wire for their service today.



Probably a Jones & Lamson Optical Comparator could effect comparable savings for you. Write for our book, "Beyond a Shadow of a Doubt." Or, better still, ask for one of our inspection engineers to call and discuss your inspection problems,



#### JONES & LAMSON

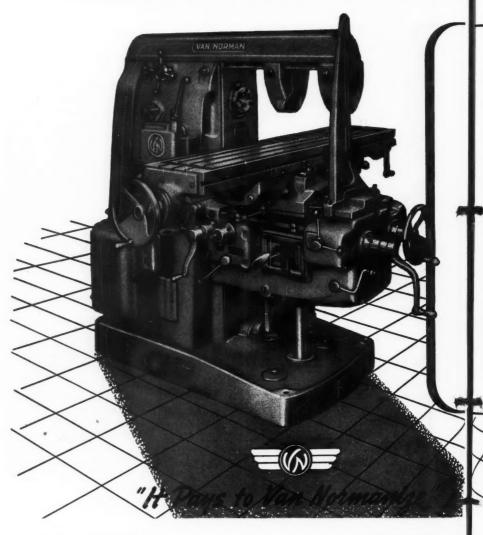
MACHINE COMPANY Springfield, Vermont U.S.A.



Manufacturar of Linivarsal Turrat Lathes • Fay Automatic Lethes • Automatic Deuble-End Milling and Centering Machines-Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Figs Relling Dies.

# VAN NORMAN HORIZONTI

Provide Improved Cutability...



# NITAL MILLING MACHINES

# **Exceptional Ease of Control**



### **Built-in Spindle Flywheel**

The Van Norman spindle design incorporates a heavy flywheel mounted inside the column. It assures uniform, uninterrupted transmission of power to the cutter because it effectually cushions by its inertia, any fluctuation of speed and power. The flywheel increases and improves cutability...results in a smooth finish of work surface.



#### 5-Bearing Spindle

The large diameter hardened alloy steel cutter spindle rotates on 5 anti-friction bearings. Large double-opposed taper roller bearings in front provide minimum overhang... center double-opposed taper roller bearings add rigidity. A straight roller bearing supports the rear. This construction assures maximum spindle support and rigidity under every type of cut.



#### Front & Rear Power Control

All power feed controls, as well as 6-way rapid traverse, can be operated from front or rear of the machine. This dual feed control simplifies operation, saves time, reduces worker fatigue. The finger tip controls are directional and can be operated either with spindle stopped or rotating.



### **Ease of Spindle Control**

The single lever speed selector, convenient spindle reverse and spindle clutch levers are located on the side of the column for ease of control. The spindle clutch lever for starting and stopping the spindle is quickly adjusted to the desired and most convenient front or rear operating position.

From every angle, Van Norman Horizontal millers give you every advantage in cutability and ease of operation. These machines will give maximum quality service and increase production on a wide

variety of general purpose and production milling. They are available in a wide variety of models and can be had with plain or universal saddles. Write for complete information.

## VAN NORMAN COMPANY

SPRINGFIELD 7, MASSACHUSETTS

# Marvel Saws Cut off Hours from Die Maintenance Time



Hubbard & Company, Pittsburgh, manufacturers of pole line hardware, picks, hammers and other drop forged specialties, use MARVEL Saws to eliminate tedious hours in making and maintaining their giant forging dies. Not only do these saws do all regular cutting-off of steel for the machine shop, die blocks for die shop and exact size billets for the forge shop, they clso materially cut the cost of die maintenance.

Previously, it was necessary to plane the face of dies being reworked. This was a long and tedious job because the die face is always work-hardened with hard spots that had to be chipped or ground out before the planer tool could make a cut. Now with MARVEL Saws, the face of a die is speedily, and accurately "skinned"—a thin slice is sawed off just behind the hard spots, ofter this speedy "skinning" and a single facing cut on the planer, the die is ready for the die sinker. This modern MARVEL method is saving Hubbard a lot of dies, materials, labor and machine time.



ARMSTRONG-BLUM MFG. CO., "The Hack Saw People"
5700 BLOOMINGDALE AVE., CHICAGO 39, U. S. A.



# Canedy -OTTO

14" No. 3000 P.V. 2-Spindle
Box Column Floor Drill

21" Sliding Head
River Drill

2-Spindle 21" Box Column
Sliding Head Floor Drill

3-Spindle 21" Box Column
Sliding Head Floor Drill

Drill presses, bearing the familiar CANEDY-OTTO name, are found in factories the world over — testifying to the world-wide, long-time acceptance of CANEDY-OTTO, "The World's Most Complete Drill Press Line." Before you specify or approve any drill press purchase, make

a careful review of the CANEDY-OTTO line — a line providing an economical, standard unit for a very wide range of drilling requirements. Write us today for catalog, putting detailed information on the complete CANEDY-OTTO Drill Press line at your fingertips.

# HEAT TREAT

**SMALL PARTS, TOOLS & DIES** 

In Your Own Plant

- Install anywhere by simple wire connection.
   Quiet in operation. No fumes or odors—no ventilating required.
- Any intelligent man can operate furnace with automatic temperature control, using established procedures.
- Operating cost under 4¢ per hour to hold 1600° F. in Model 3 furnaces, with 2¢ per kw.-hr. rate. Others in proportion.

NOW YOU CAN heat treat, harden and temper small parts in your own plant . . . without experienced heat treaters. Economical to install and use, Cooley Electric Furnaces operate efficiently at high or low heats, and save your large furnace time for work requiring large volume capacity. Here are some profitable uses:

PRODUCTION HEAT TREATING of small parts
... Small batches ... Running pilot lots to predetermine mass production techniques ... Emergency repairs ... Industrial and laboratory
testing ... Miscellaneous controlled heating jobs.



CHAMBER	8"W 6"H 14"L 1850° F. in 55-65 min. 14.8 at 230 v. 3400				10"W 6"H 18"L 1850° F. in 55-65 min.				8"W	6"H	14"L
FROM COLD									2000° F. in 21/2 hrs.		
AMPERES					19.6 at 230 v.			20.2 at 230 v. 4650			
WATTS					4500						
MODEL*	MH-3	VH-3	MK-3	VK-3	MH-4	VH-4	MK-4	VK-4		VK-5	
PRICE	160.00	185.00	200.00	225.00	245.00	270.00	285.00	310.00		340.00	

- \* M models complete with hinged door and hearth plate.
  V models have counterweighted vertical lift door.
- K models include Selective Power Modifier for input control to correct temperature lag.

ACCESSORY EQUIPMENT

#### DEALERS AND DISTRIBUTORS WANTED!

Good territories open on this extensive line of selfcontained small electric furnaces. Investigate now. FORCED CIRCULATION AIR DRAW FURNACES — Write for data.

#### FREE

NEW CATALOG completely describes all models and applications for each. Write today for your copy... no obligation.



#### COOLEY ELECTRIC MANUFACTURING CORP.

34 South Shelby Street Indianapolis 7, Indiana

INDIANAPOLIS MACHINERY EXPORT CORP.
Export Manager, 44 Whitehall Street, New York, New York

#### Make More Money from Your Grinding-Polishing Jobs



# This FREE Booklet on the New PORTER-CABLE C-6 Belt GRINDER - POLISHER

tells how you can

1. Reduce polishing time 30% to 50%.

2. Reduce other labor costs.

Improve quality and finish of your work.
 Reduce operator fatigue.

5. Do straight, flat, contour, soft buff and many other operations with the profitable abrasive belt method.

#### It also tells:

#### WHY the C-6 Gives You These and Other Advantages

• The Resilient Contact Roil—It is not a drive pulley . . . merely backs up abrasive belt. Does not lose its shape because belt does the cutting. Its resiliency prevents chatter. Heat is reduced to a minimum . . . work is not discolored, disfigured or distorted.

Abrasive Belt—Since it is factory-made, it is evenly loaded . . . has no "piled-up" grains to cut deep scratches. Cutting grits are full exposed to permit faster cutting without strain of "laying-on." Does not require costly loading of set-up wheels. Its unusual length—148"—insures cooler operation.

• The C-6 is a Compact, Complete Portable Unit—Does contour, straight, flat grinding . . . soft buffing . . . all kinds of grinding and polishing operations. Easily moved. Requires only little space—26" x 38". Fully guarded.

Read how the C-6 actually increases profits?
Write for FREE booklet "C-6" today!

#### PORTER-CABLE MACHINE CO.

300-10 WOLF ST., SYRACUSE 8, N. Y.



CINNATI, OHIO, U.S.A



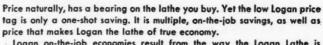
MANUFACTURERS OF MOTOR DRIVEN

Tool Post, Angle Plate, Portable Bench, Pedestal, Disc, Sno

BUFFING and

Infinitely Variable Speed—1500 to 3000 RPM with "Speedial" Control Single and Multiple Speed





Logan on-the-job economies result from the way the Logan Lathe is designed and built. For example, due to its ball bearing spindle mounting, the Logan Lathe is ready for any operating speed from 30 to 1450 rpm, with no bearing adjustment. V and flat bed ways are machined to within .0005" of parallelism. Headstock bearing faces are held to an accuracy of .0005". Rugged, massive construction is combined with this accuracy, and vital wear points are protected by self lubricating bronze bearings. Consequently, even after years of constant use, a Logan Lathe retains power for heavy cuts, speed for low cost parts production, and accuracy for exacting tool room work. In many plants, batteries of Logan Lathes handle all medium and small work, saving in power costs, set-up time, and reduced rejects. In any shop, large or small, Logan sustained accuracy and versatility save time, materials, labor and money. See the complete line of Logan Lathes and Shapers at your near-by Logan dealer's, or write direct for catalog information. AA-2



LOGAN 7" SHAPER

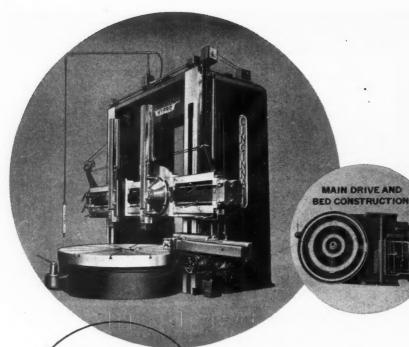
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LOGAN ENGINEERING CO. CHICAGO 30, ILLINOIS



MORE GOOD
REASONS FOR THEIR
AMAZING
PERFORMANCE

# HYPRO Boring Mill

10-FOOT - 12-FOOT

- 1. One piece speed box and bed construction, providing rigidity and preventing misalignment of shafts
- 2. Hardened steel forged gears mounted on multiple splined shafts running in anti-friction bearings
  - 3. Anti-friction bearing table mounting with 3 load carrying tracks; outside track nearly full diameter of table
- Automatic pressure lubrication to all units and parts interlocked with main drive motor

THE CINCINNATI HYPRO PLANER COMPANY
PLANERS - BORING MILLS - PLANER TYPE MILLERS
CINCINNATI, OHIO



#### After 27 Years of Service - Replaced by Curtis Timken **Bearing Compressor**

The record of 27 years of dependable service operating tools and keg testers for a nationally known cooperage company is a real tribute to the long, trouble-free life of

Curtis Air Compressors. During these years, clean, oil-free air was essential and the company enjoyed completely satisfactory service from their Curtis unit.

For the most dependable, efficient and economical supply of air, you can depend on Curtis Air Compressors year after year. Engineering advantages include:

Curtis Air Compressors, Air Hoists and Air

Write for full in-

formation on

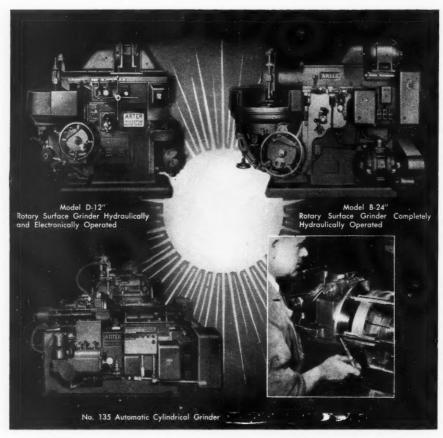
Cylinders.

- Timken Bearings
- Carbon-free disc valves
- Positive pressure lubrication—self-oiling
- Automatic pressure unloader Fully enclosed
  - Precision built

#### CURTIS PNEUMATIC MACHINERY DIVISION of Curtis Manufacturing Company

1913 Kienlen Avenue, St. Louis 20, Missouri

CURTIS PNEUMAT of Curtis Manufacturi	FIC MACHINERY DIVISION ng Company	F567C
1913 Kienlen Avenue,	St. Louis 20, Missouri	
Please send me Form	Name	
C-7 on Curtis Air	Firm	
Hoists, Air Cylin- ders and Curtis Air	Street	
Compressors.	City Zone State	



ARTER grinding machines in operation at the Machine Tool Show in Chicago, now available for prompt delivery. Model D-12" and 16", late addition to the Arter line; Model B in four sizes, 20", 24", 30", 40"; No. 135 Automatic Cylindrical Grinder, straight-in or plungecut feed on straight or tapered diameters; can be tooled for the valve stem guide job, lower right.

Whether you saw these machines or not you will be interested in complete details which are yours for the asking.

#### ARTER GRINDING MACHINE COMPANY

WORCESTER, MASSACHUSETTS . U.S. A.





You're time and money ahead in relying on your nearby Union Drawn Distributor for ALL your steel bar and shafting needs. He carries diversified stocks of cold drawn steels, built around the needs of his territory. And, his organization is geared to deliver them to you... FAST.

If, at times, he temporarily may be short of a particular size or shape, he'll turn all hands to the job of finding it for you. And, he usually will be successful.

Save yourself time—warehouse space—money. Keep in touch with your Union Drawn Distributor. Advise him of your anticipated requirements. He'll do his best to see that the bars you need are always at hand.



### -MODERNIZATION

with

#### CARTER

Guide-Line

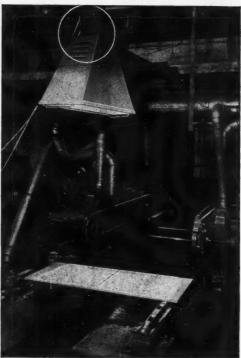
#### LIGHTS

—Brilliant WHITE
Lights that throw a
SHARP, BLACK
Shadow GUIDE-LINE

#### For Use on:

- . RIP SAWS
- TANDEM SAWS
- DOUBLE-END TENONERS
- VENEER MATCHING TABLES





With increased labor and material costs, Modernization of productive operations is the key to low-cost output. Carter Guide-Line Lights with tilting attachment enable you to increase and improve your productive output on cutting operations by providing a shadow Guide-Line which just shaves the stock to be cut.

Write today for complete information on this modern, tested, time-saving equipment.

#### CARTER PRODUCTS COMPANY

959 MICHIGAN TRUST BUILDING

**GRAND RAPIDS 2, MICHIGAN** 



#### Exceptionally Consistent REPEATABILITY

Improved design gives uniformly better performance than has yet been possible with high amplification indicators. Amplifies measurements more than 1500 times, with outstanding consistency.

#### HIGH ACCURACY

Equivalent in accuracy to that of much more costly instruments. Ideal for checking gages, inspection, high precision production, or for universal comparator applications.

#### NO FLUTTER OF HAND

The light-weight hand is instantly responsive and snaps to reading position positively, without fluttering.

#### SHOCKPROOF CONSTRUCTION

Protects vital parts from damage in case of sudden impact on contact point.



Sapphire Tipped Contact Point Guards Against Wear

Side view showing standard AGD Lug Type Back; interchangeable with conventional type indicators.

ENGLISH MODEL

Graduated .00002" Range .0018"

METRIC MODEL No. 86

Graduated .001 m/m Range .04 m/m

STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.

e

9

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\*Beefed Up"
For
PRODUCTION
Drilling and
Tapping



Buhr Standard Adjustable Drilling and Tapping Heads are engineered and built to deliver production at low unit cost. Fully adjustable, 2 to 8 spindles, for short or long runs. Rapid set up, models for all presses. Anti-friction bearing throughout; all gears shaved, spline-broached, induction hardened. Shafts and spindles splined. No corners cut in design, materials or workmanship.

Model 06-F-2 shown with No. 2 Jacobs Chucks also is available with spindles for Buhr Collets or with No. 1 Morse Taper. Drill capacity is 5/16", cast iron, minimum between centers, 1½". Buhr steel-bushed guide-bar bosses illustrated are available for precision alignment with fixture.





### CUTS GRINDING TIME 40%

THIS gray iron foundry cleaning room was using obsolete air grinders long after they should have been replaced. The Rotor Application Engineer checked their speeds and discovered they were 50% under par. He demonstrated and installed new Rotor Vertical Air Grinders—Type B-30 with 6" flared cup wheels. See lower left illustration. Now they get these results:

66% faster. The new tools have plenty of zip. Grinding time was cut 40%.

Pays for itself in 100 days because of Rotor grinder's increased production.

Easy to do good job because of tool's light weight and high power without pushing.

Perhaps we can do likewise for you.

AIR O'TOOL



Profiting by long and extensive experience in designing and building slitting lines to meet individual requirements, often involving heavy engineering expense, Yoder offers the best features of all combined in a standardized series for handling sheets and strip up to .125" thick and 36" wide. For speed, precision, ease of control, simplicity and rugged construction, this series stands unsurpassed. At the same time, import-

ant economies in engineering and maufacuring cost, achieved through standardization, are shared with the purchasers.

The benefits of standardization are also being extended to Yoder slitting lines of larger capacities.

#### THE YODER COMPANY

5532 Walworth Avenue • Cleveland 2, Ohio



ROLL FORMING, TUBE MILL AND SLITTING MACHINERY

36 YEARS' LEADERSHIP . COILING . SLITTING . FORMING . EMBOSSING . CURVING . WELDING . CUTTING-OFF

# 200 asbestos washers PER MINUTE by Automatic



#### GARDNER-GRINDING

### with a hopper feeder for small circular parts

WHEN small parallel-surface parts can be fed with a hopper, production from a modern Gardner Double Grinder is stepped up—and extreme accuracies are still obtained.

Here are 11/4" O.D. asbestos washers, ground on a Gardner No. 115-15" PRE-CISION Double Grinder, at the rate of 200 per minute. They are fed from a rotary hopper, down an inclined chute to a belt-type feeding attachment, which carries them through in a continuous stream between the opposed grinding wheels. A cost-cutting, fully AUTOMATIC operation—operator merely keeps the hopper filled.

Read the right-hand panel for the complete production story — then





Use Modern GARDNER WIRE-LOKT Abrasives on YOUR Disc Grinders!

#### WORK DATA

Part Washer 15 C.D.

Material Asserts composition
Operation Science parallel

faces
Tolerances coas for flatours;
car for parallelism
Stock Removal 215 to 225 "
Maximum assall
Production 200 pieces per

minute
Machine Darlace To. 45 "
Double Dunden

WRITE FOR OUR Double Grinder BULLETINI

GARDNER-GRIND YOUR Flat SURFACES

MACHINE COMPANY

428 East Gardner Street \* \* \* \* Beloit, Wisconsin, U.S.A.

# FIRST IN DESIGN.

Kearney & Trecker announces new in accuracy.. First in rigidity..

MILLING MACHINES AT THEIR BEST DESIGNED TO PUSH COST CURVES DOWN

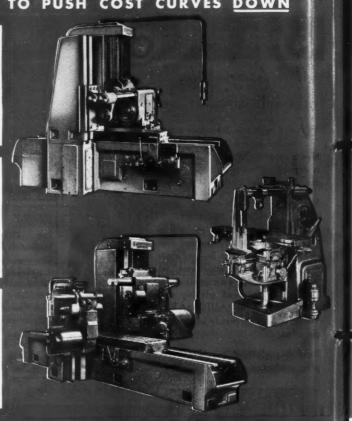
New! Kearney & Trecker-Milwaukee Series of Simplex Bed-Type Milling Machines

These machines bring you a completely new design with a combination of exceptionally wide working ranges and horsepower capacities for most effective use of modern cutting tools,

The new Kearney & Trecker — Milwaukee Model E simplified milling machine

This machine incorporates every fundamental requirement for either foreign or domestic use. Modern design plus economy of parts offers you highest dollar for dollar efficiency obtainable.

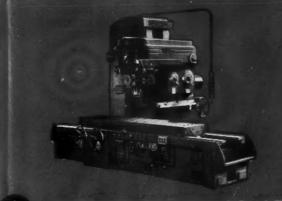
Duplex Bed-Type Milling Machines offer 48 different working ranges and horsepower combinations Machines that offer custom-built possibilities for your work at standard machine costs to you. Truly an entirely new concept in bed-type design — they use all modern cutting tools to maximum effectiveness.



KEARNEY &

# IN COST-CUTT

outstanding machine tools . . . First First in all-round performance!



World's most advanced

milling machine The new Model 5D combines bed-type machine working range with revo-lutionary Kearney & Trecker Rotary-Head Principle of Milling, Mills any geometric shape, in horizontal or vertical planes, directly from blue print, without models or templets. For versatility of application, it leaves rething to be desired. nothing to be desired.

AT THEIR MACHINES BEST-BORING DESIGNED TO PUSH PRECISION CURVES UP



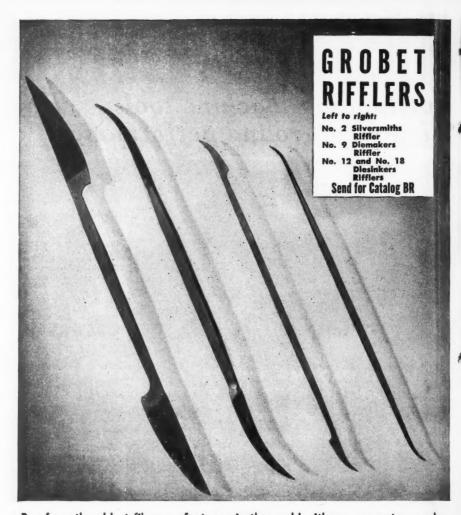
America's finest preci-

sion boring machines
The Model B Autometric
(left) for horizontal work
and the Model C Autometric (right) for vertical work. Each machine is the direct result of nearly a half-century of experience and several years of intensive research in design and manufacture of precision machine tools. Every refinement, of a practical nature, that can be used in performing highly accurate work has been incorporated in these machines

TRECKER

MILWAUKEE 14, WISCONSIN





Buy from the oldest file manufacturers in the world with over a century and a third of experience and reputation. GROBET produces more Rifflers, in more shapes and more sizes than any other company.

Ask for catalog F from your industrial supply house.

#### GROBET FILE CO. of AMERICA Inc.

421 Canal Street (1812



New York, 13 N. Y.

MFRS. OF GROBET ROTARY FILES



Have you a
SMALL
PARTS
Filing Job?



# Use AMERICAN SWISS Swiss-Pattern Files

Small fillets, holes, slots, curves, edges and surfaces may seem to be trouble-some filing jobs—but not if you use "American Swiss" Swiss-Pattern Files. When you standardize on this extensive line of precision tools, you have a selection of more than 3000 different shapes, cuts and sizes to choose from —including widths and diameters as

small as 1/16", thicknesses as small as 22 B&S, and cuts as fine as 200 or more teeth per inch. So, for "small parts" filing, as well as for all accurate or finishing filing, use "American Swiss" files—they will help you do better, faster, more economical work.

**Buy From Our Local Distributor** 

AMERICAN SWISS FILE & TOOL CO., 410 Trumbull St., Elizabeth 1, N.J.

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SWISS PATTERN FILES



#### ACME BENCH VISES

Precision - Built for Light or Heavy Duty

Made in Sizes from 2" to 6"

No Side Twist

Even, Central Pull

Greater Holding Power

Practically Indestructible

Interchangeable Ground Jaws



#### **Universal ROTARY TABLES**



- ★ Made in 7 sizes
- ★ Often takes the place of costly fixtures.
- \* Reduces set-up time.
- ★ Used for many operations on milling machines, drill presses and horizontal boring mills.

Dividing attachments are available to fit all model tables, except the 9". One attachment is interchangeable on 3 sizes of tables.



Write for literature

**Prompt delivery** 

ACME TOOL COMPANY

69 WEST BROADWAY

NEW YORK 7, N. Y.



#### GENERAL FLEXIBLE-POWER PRESSES

Three of many examples of production assembly operations done faster at less cost on General Flexible-Power Presses:

#### CYLINDER LINING

Production rate increased 50%.

#### PRESSING TUBES INTO HOUSINGS

Production increased from 30 to 100 pieces per hour.

#### **BURNISHING SPLINED HOLES**

Production increased from 90 to 200 pieces per hour or 122%.

Flexible-Power Presses are easy to operate—Power and Length of stroke are instantly controlled by one foot pedal leaving both hands free to handle the work.

2161

# General Manufacturing co.

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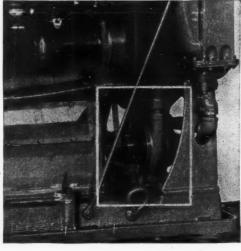
October, 1947

MODERN MAC INE SHOP

51



#### CENTRIFUGAL COOLANT PUMPS





The FULFLO COOLANT PUMPS direct the coolant right up to the very point which requires maintenance of workable temperatures.

The versatility of the pump is illustrated here, circulating the cooling water of the engine made by Universal Motor Co., Oshkosh, Wis.

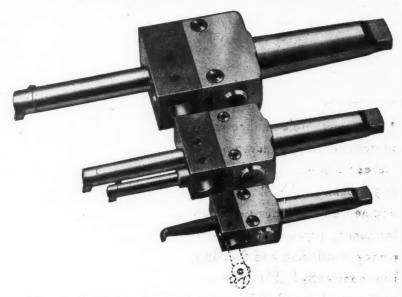
Let FULFLO ENGINEERS submit suggestions on your cooling problems. No obligation, of course.



### flashing new addition to a famous line CHICAGO WHEEL & MFG. CO. Headquarters for MOUNTED WHEELS and SMALL GRINDING WHEELS Big news, welcome news! A sensational new grinding wheel makes its bow . . . it's the startling, shining SILVER STREAK ongineered for super-twift performance, unprecedented efficiency in grinding and finishing; kept constantly FRESH by a protective metallic film! Try it yourself! Stronger than words is the proof you will see for yourself, in your own plant, that the new SILVER STREAK is the wheel you can't afford to pass by, the wheel that solves your grinding problems. Tell us the kind of job you have. We'll send a test SILVER STREAK promptly. CHICAGO WHEEL & MFG. CO., 1101 Monroe St., Dept. MM, Chicago 7, Illinois. Send Test Wheel for use on..... Send catalog of complete line.

### MAXWELL BORING HEADS

Unconditionally Guaranteed



THIS popular line of Tools has been the standard for precision boring for a great many years. Always high quality at low prices.

Adaptable to any machine in your plant. Immediately available. Consistently first with the features that improve quality. Designed by practical men for all-around use. Three sizes with large capacities.

Write for circular.

THE MAXWELL COMPA

325 BROADWAY

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Wi

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ma Raj Every working day thousands of plants all over the world prove the....



# Unqualified Excellence



#### of GRAND RAPIDS GRINDERS

here's why • Every Grand Rapids
Grinder, large or small, has every essential feature
for fast, efficient, low-cost production.
Refinements in construction details such as the
massive castings, heavy, rigid spindles,
separate spindle motors, assure years and
years of trouble-free life.
Grand Rapids No. 60 Universal Cutter and
Tool Grinder and No. 35 Grand Rapids
Hydraulic Feed Surface Grinder will handle
all of your tool room jobs from grinding of dies
to sharpening all types of milling cutters,
reamers and similar tools.

#### What "GRAND RAPIDS" quality means:

Gallmeyer & Livingston cast their own closegrained gray iron, machine to micrometric tolerances, and precision-assemble grinding machinery of unsurpassed performance. *Grand Rapids* means top quality in grinding machinery.



GALLMEYER & LIVINGSTON COMPANY
308 STRAIGHT AVENUE, S. W., GRAND RAPIDS 4, MICHIGAN

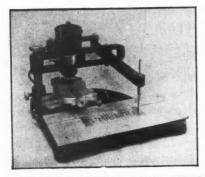
#### Fast, Efficient, Economical Production of ....

IF you're looking for fast, accurate production of these machining operations, it will pay you to investigate AUTO ENGRAVER equipment. Precision made in all respects...they'll do a real job.



SIMPLE TO OPERATE

CC-3D



- . MILLING
- . BORING
- . DRILLING
- PROFILING
- ENGRAVING
- . ROUTING

and similar precision machining operations

A 2 and 3-dimensional cutting, milling or engraving machine designed to reproduce any required shape, line or contour from an enlarged master template. The "Control-Cut" now makes production of Blanking Dies, Templates, Molds, Milling irregular slots, contours, parts of machines, or instruments, or any 2 or 3-dimensional metal removal operation simple, fast and inexpensive. Fully ball bearinged, 3 spindle speeds, variable ratio pantograph from 2:1 to 4:1 and intermediate ratios.

#### Portable PANTOGRAPH ENGRAVER

Model CC-2A A precision industrial engraver that does not require skilled operators. Designed for rapid, accurate engraving of letters, designs, small panels, name plates and parts, and experimental work in the lab. Pantograph arms permit easy control of machine; adjustable control determines depth of cut. Engraves brass, steel, aluminum, ivory, wood and all types of plastics..... \$250

Model PE-1 Larger and more sturdily built than CC-2A. Capable of greater continuous production capacity . . . . \$425



#### PHILBRO VERTICAL MILLING ATTACHMENT

A completely ball bearinged attachment that will lower production costs. Designed for precision machining operations, it will accurately, efficiently, economically and speedily MILL, BORE and DRILL. It can be mounted in a jiffy, will tilt to any required angle, has heavy over-sized spindle. Takes cutters and end mills up to  $\frac{1}{2}$  and has 4 spindle speeds.  $\frac{1}{3}$  hp A.C. motor \$40 additional.

Priced F.O.B., N. Y. at. \$135

Send for Complete Details.

AUTO ENGRAVER COMPANY, Inc.

# THOR GRINDERS LAST LONGER!

the Thor

"Shock-Absorber" Spindle

PROTECTS THE MOTOR AGAINST VIBRATION

Resilient, metal strips absorb the shock.

You'll get more work-

faster—with this THOR
HEAVY DUTY ELECTRIC
GRINDER... Its exclusive "ShockAbsorber" Spindle assures longer useful
life—a real economy in grinder service. Ask

your nearby Thor distributor for a demonstration.

600 W. Jackson Boulevard, Chicago 6, Illinois Export Division: 330 West 42nd Street, New York 18, N.Y. BRANCHES IN PRINCIPAL CITIES



PORTABLE POWER

TOOLS

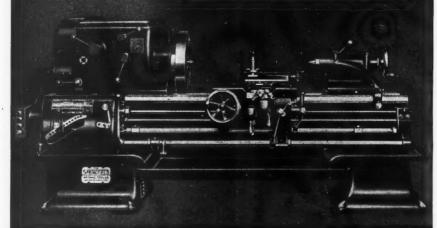
PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS



Tool Room Lathes have lead screw reversing mechanism which produces right and left hand threads and feeds with automatic stops for both lead screw and feed rod.

Deep, well ribbed lathe bed of high test nickel chrome gray Iron assures extreme accuracy and long life.

Ground gears and up-to-date oiling systems on all sizes. Write for Builetin 162.



THE SPRINGFIELD MACHINE TOOL CO. SPRINGFIELD 99 OHIO, U. S. A.



A fast, accurate assembly tool—the Mall Screwdriver drives screws to uniform tightness at top speed. Its light weight (only 3 lbs. without cord), compact design, and convenient pistol type grip make for easy operation and reduce operator fatigue. Its adjustable single slip clutch can be set at a predetermined uniform tightness so that when the screw reaches this tension, the clutch automatically "slips"—eliminating stripped off screw threads and broken studs. It is ruggedly constructed with die cast aluminum housing, extra long brushes, hardened steel gears and self lubricating bearings. Available in two voltages—110-volt AC-DC or 220-volt AC-DC.

Ask your Supplier or write Power Tool Division for literature.

#### MALL TOOL COMPANY

7814 South Chicago Avenue

Chicago 19, Illinois

=26 Years of "Better Tools For Better Work"=

# Send your FORM-TOOL specs to J&S

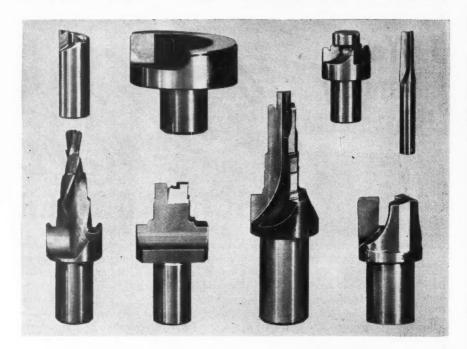
If you need form-tools in any quantity, it will pay you to use our form-grinding service. We do a large volume of this work for many of the leading manufacturing concerns.

Our wide experience has developed in us a "tool sense" that enables us to read between the lines of form tool specifications and "grasp the idea" behind them. J & S equipment of exclusive design, reducing man hours required to form-grind

spiral tools, enables us to turn out these difficult tools at attractive prices.

Among the form-tools we produce are: counterbores, cold-heading dies, countersinks, taper reamers, gun drills, flat drills, end cutters, boring tools, step drills, hollow mills, recess tools and combination tools. We also produce small form-tools for manufacturers of watches, clocks, meters and instruments.

Send us your form-tool specs for quotation.



JeS TOOL CO. 471 Main Street, East Orange, N. J. Representatives in Principal Cities.



There is only one way to correctly tension a stud or bolt ... and that way is to know the tension . . . accurately . . . as the stud or bolt is tightened.

Snap-on Torqometers make precision tensioning a simple operation. Even the unskilled worker can hit the specified pressure every time . . . right to the correct inch or foot pound. There is no guesswork . . . faulty conditions caused by me-chanical distortion are eliminated.

A complete line of Snap-on Torqometers is available for all industrial bolt tension-. . from the big, husky, 2000 ft. lb.

SNAP-ON TOOLS CORPORATION

size down to the 30 in. lb. size for delicate adjustments on fine assembly work. Send for catalog showing complete line of Snap-on Torgometers,



8032-J 28th Ave., Kenosha, Wisconsin International Division: Kenosha, Wis., U.S.A.



This new Heim Roller Bearing Pillow Block provides a low cost, highly efficient means of supporting any revolving shaft. It represents the application of a rugged base and metal strap to the well known Heim Flanged Type Self Contained Roller Bearing to make a Pillow Block of extreme simplicity. Stock sizes for shaft diameters up to one inch.

The rollers are kept dust free by the flanged construction of the outer casing and the inner roller race, which also retains the lubrication. Full length rollers provide maximum load carrying capacity. May be mounted upright, vertically, horizontally, or at any angle. Please write for bulletin of complete data with specifications and list of stock sizes.

Unibal Spherical Bearings

THE HEIM



Rod Ends . . . Die Polishing machines

COMPANY

62

#### On Parts Like These...



finish required.

Smooth finish and close tolerance easily held on 1 1/2" hole in steel

vibrator body.

With the Sunnen Precision **Honing Machine** 

Accurately...Reduces Rejects

Saves Time . . . Increases Production ... Duplicates Sizes Quickly and

production increased these line reamer bushings.

Sunnen honing is used to finish cylinders, fit piston pins



duced on fuel injection pump



Tolerance .0002" finish of 10 microinches produced on these sewing machine parts.

It will quickly size and finish parts made of steel, cast iron, bronze, aluminum, carbides, glass or ceramics in any diameter from .120" to 2.625". Honing stones are available to produce any commercial

This machine produces a true round hole with guaranteed accuracy to .0001"—can be set up in less than one minute-operates without jigs or fixturesis simple to operate and low in cost.

For production, the Sunnen Precision Honing Machine provides real savings on long run jobsand even greater savings on short run production when there are frequent size changes.

Write today for literature or ask a Sunnen engineer to give you complete information.



Two lands, 3/4" long, honed in perfect align ment.

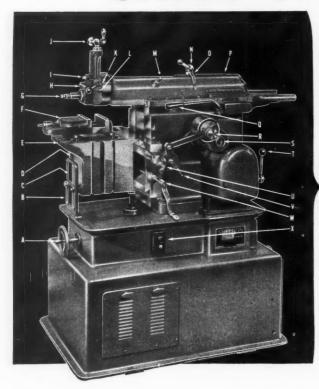
ooth surfaces pro vide long life for washing machine



SUNNEN COMPANY PRODUCTS

> 7933 Manchester Ave., St. Louis 17, Mo. Canadian Factory: Chatham, Ontaria

### **SHELDON**



- A-Variable Speed Hand Wheel
- **B**—Table Support
- C-Table Protractor (Not Shown)
- D-Cross Rail Lock
- E—Table
- F\_Vise
- 6-Tool Holder
- H-Clapper Box
- I-Clapper Box Lock
- I—Tool Slide Handle
- K-Tool Slide Lock
- L-Tool Slide Swivel Lock
- M-Ram Positioner
- N-Ram Clamp
- 0-Stroke Indicator
- 0-Clutch
- R-Feed Adjustment
- S-Shaft for Adjusting Length of Stroke
  - T-Back Gear Lever
- U-Cross Feed Screw
- V-Feed Direction Control
- W-Elevating Shaft
- X-Motor Switch



No. 8000 12" SHAPER

Engineered to meet today's demand for close tolerance work at a wide range of speeds . . . for a compact, easy to operate shaper that is sturdy enough for production use, still accurate enough for the tool room . . . for a capable full sized (1800 lb.) shaper at a low price.

> Here is a modern quality shaper you should know about. Write for Bulletin 547B.



Manufacturers of Sheldon Precision Lathes . Milling Machines . Shapers 4250 N. KNOX AVENUE . CHICAGO 41. ILLINOIS. U.S. A.

### HAVING MOUNTED WHEEL TROUBLE? TRY BAY STATE!

• Will not break loose from spindles

● Consistent hardness-no soft spots

Shaped on spindles-run absolutely true

• Ready for immediate cutting action

Our catalog on these abrasive products contains a great deal of helpful information. It is yours for the asking. Write wor ask your Bay State distributor for one.

BAY STATE

Branch Offices & Warehouse Chicago-Detro Distributors-All principal cities

Top Performance Consistently Duplicated
BAY STATE ABRASTYE PRODUCTS CO. . WESTBOND, MASSACHUSETTS, U.S.A.



- It finishes aircraft, Diesel, gas and compressor cylinders faster than any other method.
- Assures highest degree of accuracy with any surface finish desired.
- Produces straight, round, smooth bores to working tolerances as close as .0002".
- Wide range of spindle and reciprocating speeds permits honing small or large diameters.
  - 5 Oversize capacity gears and bearings permit continuous operation under heaviest loads.
  - Simple to operate. Inexperienced operators can obtain precision results.
- Patented Fulmer Control System places all controls at "floor level", in front of machine, within easy reach of operator.
- Patented Fulmer "Stop and Dwell" system permits honing up to internal shoulders or to the head end of blind cylinders.
- Exclusive Fulmer Sump System collects over 90% of the sludge.
- Uses any make of conventional honing heads.

#### C. ALLEN FULMER COMPANY

1233 First National Bank Bldg., Cincinnati, Ohio

ODUCTION EQUIPMENT

HONING MACHINES PISTON RING LAPPERS

CENTRIFUGAL CASTING MACHINES

**DEALERS:** A few attractive territories remain open. Write today!



PRICES start at \$145.00, f.o.b. factory. Average increase less than 15%

over prewar price level.

TIME PAYMENTS; 25%
down, twelve months
to pay balance. Moderate finance charge.

SOUTH BEND LATHES also made with 10", 13", 14½", 16", and 16/24" swings. Write for information today.

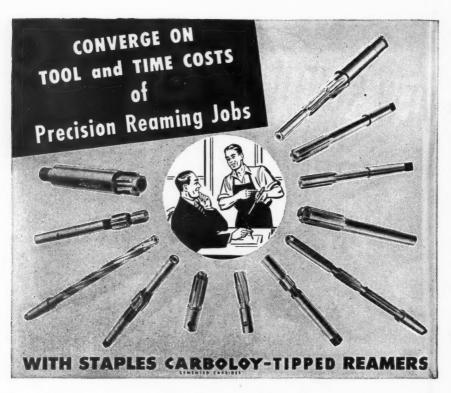
The South Bend 9" Lathe is ideal for the production of small accurate parts, for toolroom work, and for use wherever accuracy is essential in the working of metal, plastics, fibre, or other machinable materials.

Catalog 9-J illustrates all South Bend 9" Lathes, lists complete specifications, and shows attachments and accessories. Mailed on request—write for copy, today!

BUILDING BETTER LATHES SINCE 1906



SOUTH BEND LATHE WORKS



If you have a precision reaming job, Staples has the reamer for it. Staples Solid and Expansion Reamers are precision engineered to consistently produce accurate, fine finish holes throughout exceptionally long production runs. These tools far exceed H. S. S. on tool life; require a minimum of servicing.

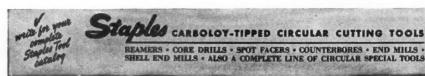
High quality production standards enable Staples to maintain closer tolerances in reamer size, straightness and concentricity. Staples Reamers are produced to a total tolerance of .0003" on diameter. All carbide surfaces are diamond wheel finish ground and diamond lapped to size. Finish ground flutes assure free chip passage.

By replacing with Staples Standard or Special (designed-to-job) Reamers on routine and complex operations, many manufacturers have cut tool costs, gained improved tool performance, and have eliminated frequent, costly down time. *Your* production may also benefit. Call in a Staples Tool Engineer for an on-the-job demonstration. There is no obligation.

THE STAPLES TOOL COMPANY CINCINNATI 25

OHIO

Distributors in Major Cities





A complete range of lead variations—you can set your machine for any one of them in exactly one and one-half minutes!

Compare that performance with a normal toolroom lathe's—and change gears requiring thirty minutes to change. Think what you'll save on production time—and on original investment in change gears, too—especially if any sizable share of your production is thread molds for plastics.

Principal among the patented features of this new Monarch moldmaker's tool-room lathe is the adjustable leadscrew variating mechanism—a device that makes it a simple matter to compensate for the

shrinkage of the material to be molded. Plastic thread molds become a mere routine production operation.

Then there's a speed-reducer—that permits slowing down to a fraction of a revolution a minute for internal and external milling operations, performed at a single setting of the mold in the lathe.

Added to these are the features built into every Monarch toolroom lathe (and the machine is equally adaptable for normal toolroom work)—features that have a proved record for precision and long life. Like more facts? Ask for specification sheet 405—or call your nearest Monarch representative.

THE MONARCH MACHINE TOOL CO. . SIDNEY, OHIO



Reg. U. S. Pat. Off.

SELF-LOCKERS





PAT'D AND PATS. PENDING.

stay put--regardless of the most chattering vibration . . .

PAT'D AND PATS. PENDING.

Knurling of Socket Screws originated with "Unbrako" in 1934.

"Unbrake" and "Hallowell"
Products are sold entirely
through Industrial
Distributors.



The "Unbrako" Socket Set Screw (A) with Knurled Cup Point is a Self-Locker whose point digs-in and stays dug—regardless of the most chattering vibration. Yet, it can be backed-out with a wrench and used over and over again. The "Unbrako" Socket Set Screw with Knurled Threads (B) is a most excellent Self-Locker, too, because the knurling, as shown, swages the threads when locking results. To be used with points such as: flat, dog, cone and oval which do not lend themselves to knurling. In sizes from No. 4 to 1½" in diameter . . . millions in use. Write for the "Unbrako" Catalog of Socket Screw Products.

You can't tighten (or loosen) socket screws without a hex socket wrench, so why not get our No. 25 or No. 50 "Hallowell" Hollow Handle Key Kit which contains most all hex bits.

**OVER 44 YEARS IN BUSINESS** 

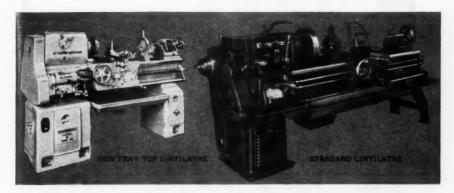
STANDARD PRESSED STEEL CO.

TENENTOWN PENNA BOX 555 - TRANSHES BOSTON - CHICAGO - DETROCK - GIOLENADOUR - ST. FOLIS - RAN TRANSFEREN

70

### CINTILATHES

# of Outstanding Value



THE NEW TRAY TOP CINTILATHE, a light duty, low cost, Motor Driven Geared Head Engine Lathe, offers features not usually included in lathes of their size and price range. Built in 10°, 12½°, 15° and 18° swing sizes, and distances between centers from 18° to 60°, 12 spindle speeds, with an overall ratio of 41 to 1, 48 thread and feed changes.

Standard Motor Drive 10"—1 H.P., 12½"—1½ H.P., 15"—2 H.P., 18"—3 H.P.

THE NEW CONTOURMATIC CINTILATHE, a standard engine lathe equipped with a simplified all-hydraulic, sensitive tracing attachment, automatically and accurately duplicates the contour of a master template. The master may be a turned work piece or a flat template.

The New Contourmatic Cintilathe produces work of a circular cross section such as multiple diameter shafts or similar parts which may include grinding necks, tapers in both directions, shoulders, or irregular contours along the axis, unaffected by the variations incurred with operator controlled machines.

STANDARD CINTILATHES in six nominal swings 14" to 24", bed lengths providing distances between centers from 32" to 238", 12 Spindle Speeds—32 changes of threads and feeds. These medium duty, low cost lathes handle a wide variety of turning, boring and threading operations for long or short run lots. They offer capacity for practically all of your lathe work with a minimum of investment.

THE NEW TRACERMATIC CINTILATHE is a special machine for use primarily on molds for bottles, table ware and other items in glass industry, embossing dies, dies for plastics, etc., where extreme accuracy, fineness of detail, and speed of production are required.

The work need not be circular in cross section. Ovals, squares, rectangles, etc., with rounded corners and intricate patterns are readily produced.

Write for catalog, price and delivery on the "CINTILATHE" line of lathes.

CINCINNATI

CABLE ADDRESS: CINTILATHE



LATHE & TOOL CO.

OAKLEY, CINCINNATI 9, OHIO

## A BUYING GUIDE FOR ABRASIVES

POINT No. 9



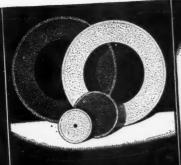
## **Complete Line of Abrasives**

The Carborundum Company makes the only complete line of abrasives produced under one trade mark.

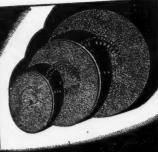
With industrial techniques utilizing a wider variety of different type abrasives, it is only logical that users turn to The Carborundum Company as the one primary source for all abrasive needs. Product quality is known and highly regarded. Specialized service on all abrasive problems and applications is covered by experienced representatives who are free to recommend the best abrasive products for your requirements. Satisfaction is assured. Of even more importance to many, responsibility is definitely fixed and undivided. For reasons such as these, there is an increasing preference for products by CARBORUNDUM. The Carborundum Company, Niagara Falls, New York.



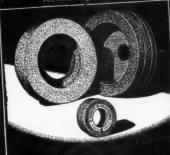
A Good Rule for Good Grinding



Specialized wheels by CARBORUNDUM for thread grinding.



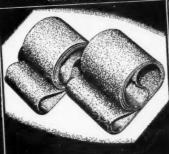
Cutting-off wheels ... the modern tool for faster, less costly, more finished cuts.



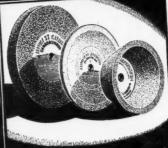
Cool-cutting green grit wheels for cemented carbide.



Diamond wheels to meet stiffer technical needs.



A coated abrasive for every randing and finishing condition



All standard shapes are supplied in grinding wheels by CARBORUNDUM

CALL IN

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CARBORUNDUM

● BONDED ABRASIVES ● COATED ABRASIVES ● ABRASIVE GRAINS AND COMPOUNDS



**Built Into** 

## SHAPE-RITE SHAPERS

You can depend upon the built-in accuracy and durability of Shape-Rite Shapers to withstand day-in and day-out capacity production. The speedy set up features and ease of operation will increase the output of precision work. Shape-Rite Shapers are Versatile, and will handle any type of work within the capacity of eight-inch stroke Shapers. Unexcelled for Tool and Die Makers and small instrument manufacturers.

Complete Specifications on Request Write to Dept. M-10.

Sales Service Machine Tool Co.
2363 UNIVERSITY AVE. ST. PAUL 4. MINNESOTA



The Oliver Ace keeps production cutters in top performance condition at greatly lowered costs-It is simple to set up, highly accurate, and physically easy to operate. It saves setting up time, only two fixtures are needed to grind all standard types of cutters.

IMPROVE YOUR TOOLROOM



Send for Illustrated literature.

T'S THE BACKBONE F PRODUCTION

AUTOMATIC DRILL GRINDERS TOOL & CUTTER GRINDERS - DEILL POINT THINNERS - TEMPLATE TOOL GRINDERS - FACE MILL GRINDERS-DIEMAKING MACHINES

ADRIAN, MICH.

# Bridgebort

### TURRET MILLING MACHINE

THE BRIDGEPORT TURRET MILLING MACHINE has won universal acceptance. It has proved a most valuable time and labor saver in the tool rooms and production departments of the largest plants. Its wide range and versatility in milling, drilling, boring and shaping enable it to serve as the complete central machine around which all operations revolve in many small shops.

It will pay you to explore the possibilities of the "BRIDGEPORT" in your plant.

BRIDGEPORT MACHINES, INC.

# SNAP and STAMINA!

NEVER BEFORE in this type of valve-ruggedness, relia-

bility, low cost and low maintenance, PLUS the choice of foot or hand lever control. That's Ross' answer for small air cylinder use on machines where easy operation, continuous high production and compactness are "musts". It's Ross quality, of course, precision-machined brass and stainless steel construction, yet at a price you can't afford



#### Available

Your choice foot

to pass up.

Operating VALVE CO.

6484 EPWORTH BLVD.

**DETROIT 10, MICHIGAN** 

# AT 1/3 THE ORDINARY COST





SIDE INSTALLATION

FRONT INSTALLATION

#### Fits All Benchmaster Models; Most Other Punch Presses

The remarkably low cost—1/4 to 1/2 the price ordinarily charged for similar equipment—plus its many exclusive, time and cost slashing features, makes this new Benchmaster Automatic Friction Roll Feed a must for all punch press operators. Fits all Benchmaster models and most other standard punch presses. May be used with metal, wood, plastic, felt and cardboard.

**FEATURES:** Friction drive gives 0 to 3" adjustment in feed (longer feed obtainable on request); takes stock up to 3" in width; adjustment for thicknesses of stock in thousandths from 0 to 3/16"; ht. adjustment, 0 to 2½"; full speed of 285 strokes per min.; rollers quickly

reversed from forward to backward; adjustable brake; simple 2-bolt installation permits changing from front to side of press in seconds; rollers (2¼" in diameter) and friction roll are hardened and ground; bronze bearings protect all wear points. Immediate delivery.

### BENCHMASTER'S IMPROVED MODEL 4-TON CAPACITY BENCH PUNCH PRESS

It will pay you to investigate the low cost and high quality of the famous Benchmaster 4-ton Capacity Bench Punch Press, now improved and better than ever.

For full information about new Benchmaster Friction Roll Feed and Benchmaster's Improved Model Punch Press, write today to Dept. MM-10.









## MANHATTAN POLISHING WHEELS ABRASIVE BONDED IN SOFT NEOPRENE

Any required flexibility from the softest, as illustrated, to the firmest, for deburring and light welds. For variety of applications—finishing stainless steel, taps and twist drills, stampings, die castings, non-ferrous and precious metals, and glass. Surface speeds 3,000 to 8,500 SFPM. Also available in the form of blocks and rubbing pads.

The Manhattan Polishing Wheel is patented.

ABRASIVE WHEEL DEPARTMENT





RAYBESTOS-MANHATTAN INC.

Keep Ahead with Manhattan

MANHATTAN RUBBER DIVISION

PASSAIC, NEW JERSEY

October, 1947

MODERN MACHINE SHOP

75

SPECIFY P-K AND GET...

# GROUND THREADS



THREAD GRINDING, once reserved for screws used in the finest precision equipment, now gives P-K Socket Set Screws the mirror-smoothness characteristic of a ground finish — free from nicks, burrs, hardening

scale and other imperfections common to cut threads. Made from hardened blanks, free from hardening distortion, uniform dependable Class 3 Fit is assured.

AVAILABLE FOR PROMPT DELIVERY

COMPARE! ASK FOR SAMPLES. See why P-K Ground Thread Socket Set Screws are different from ordinary set screws as night and day... why they will speed assemblies, improve strength and safety. You'll agree

your products will benefit — assembly-wise and sales-wise! Available now — Send for Stock List. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

WRITE FOR SAMPLES

PARKER-KALON
WHEN GOOD DESIGN CALLS FOR
SOCKET SCREWS
SOLD ONLY
BY ACCEPUITD DISTRIBUTORS

# with these Brown & Sharpe Side Mills

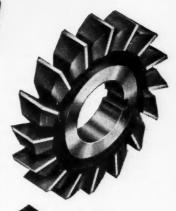


Frequently used in pairs for sizing nuts, bolt heads and similar work. Cutting edges on both sides of teeth as well as periphery.

• These side mills have clean-cutting qualities... ample chip space, carefully calculated rake angle, selected steels, scientific heat treatment individualized for each type of cutter, and expert sharpening... qualities that users have learned to expect in Brown & Sharpe Cutters. They're money-savers and production-boosters... offering unexcelled performance in speed, accuracy and more pieces per sharpening. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.



Alternate right- and left-hand spiral angles with considerable angle of undercut permit heavy cuts without destructive vibration and chatter.

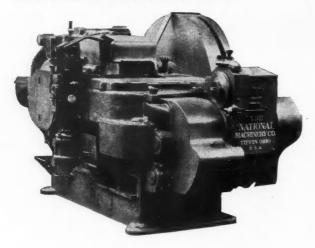


### HALF SIDE

Used for side cuts, as in straddle milling or in cutting slots. Spiral on top and undercut on side give teeth improved cutting action.

We urge buying through the Distributor

# B-RIGHT-ON SOCKET SCREW PRODUCTS ARE USED ON THE MOST MODERN MACHINE TOOLS





Pictured above is one of the modern machines on which B-RIGHT-ON Socket Head Cap Screws are completely cold forged.

The body and thread diameters of the cap screws are formed by the Double Extrusion process. The result is a perfect socket screw with the highest physical properties. B-RIGHT-ON SOCKET SCREW PRODUCTS
ARE MADE ON THE
MOST MODERN MACHINE TOOLS



The very modern machine shown above, together with other types of highly productive and extremely accurate machine tools, enables us to offer you service and products which are always

DEPENDABLE

If your dealer can't supply you, write to us.

THE BRIGHTON SCREW & MFG. CO.

**READING RD. AT DORCHESTER** 

CINCINNATI 2, OHIO



## BAKER KEYSEATER

for Speed and Accuracy!

Baker Model 0 Keyseater meets demands for speed, accuracy and alignment in the finished keyseat. Soundly designed ... sturdily built for trouble-free, long-life performance. Operated on the draw cut principle: equipped with a pushbutton controlled, non-reversing type, 2 HP, 1200 RPM motor, mounted on a pivoted base; crank action adjustable for setting stroke from 0 to 9". Capacity ample to cut keyways in mild steel up to 9" long by 1" wide at a feed of .005". Write for bulletin.







## for Easy Leveling!

Baker Jacks solve the problem of keeping equipment level amd in alignment-for maintaining highest efficiency of machine tools. These jacks are positive in action yet readily adjustable. Machines mounted on them can be checked frequently and corrected at little expense. Leveling time is negligible and the equipment is held firmly in place. Thoroughly tested ... offered in three sizes. Write for more details.



No. 42
For small planers, boring mills, etc.



No. 43
For large boring mills, planers, etc.

BAKER BROTHERS, Inc., Toledo, Ohio

DRILLING, TAPPING, KEYSEATING and CONTOUR GRINDING MACHINES



# ousselle Punch presses

5 & 10 TON CAPACITY BENCH PRESSES



These Pre es were de Signal

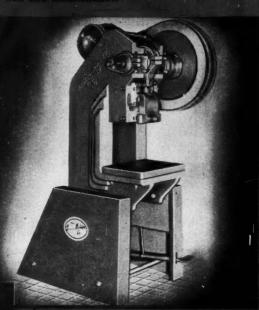
5, 10, 15, & 25 TON O.B.I. FLOOR MODELS

to provide strength, ac-curacy, speed and endur-

These models will handle any requirements within their capacities for stamping, blanking, forming and any other high speed opera-



FOR FURTHER DETAILS -SEE YOUR DEALER OR WRITE US



15 TON HORN PRESS

This Press is performing a wider variety of jobs which until recently were not thought of as Press operations.

SERVICE MACHINE CO.

7633 S. ASHLAND AVE., CHICAGO, ILL.

YESTERDAY'S PIONEER · · · TODAY'S LEADER



These end cutting tools were specially designed for high production operation. They are form ground all over, and the original forms are maintained throughout the entire life of the tools.

Can be furnished to special order in any size or design. As illustrated above these end cutting tools measure 4¼" in length by 5" O.D. The cutting portion is 3¾" in diameter.

Conforming to the Weldon usual high standard of quality these end cutting tools are exceptionally fast-cutting, accurate and dependable. Write for more information.





#### for maximum removal of metal-with low maintenance

Steel clad spindle and motor housings—lightweight steel tube construction can take rough handling...resists wear and tear.

Constant speed governor – holds wheel at most efficient cutting speed, from no load to full load . . . eliminates danger of overspeed when running free.

Movable exhaust ports - can be

revolved to any desired position and locked.

Easy action throttle valve—takes the jerk out of starting.

Multiple disc air cleaner—offers no resistance to air flow.

Built-in lubricator—large capacity reservoir . . . trouble-free, non-clogging, porous wick system.

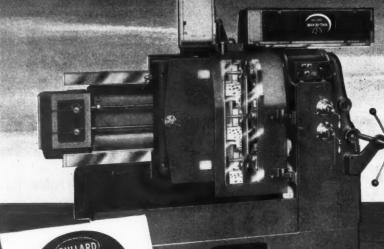
Available in wide range of models for 4", 6", and 8" diameter wheels, with speeds from 2000 to 9000 R.P.M. Straight or pistol grip handles; 20" and 35" extensions; wire brush attachments, etc. Write for Bulletin SP-2068.



Pasumatic Tools - Air Compressors - Electric Tools - Diesel Engines - Rock Brills - Mydraulic Tools - Yacuum Pumps - Aviation Accessories

# THE THE Shaft-turning

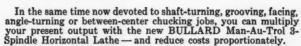
Model 3011 produces three identical parts of once with interchangeable manual or automatic control t





SULLARD CREATES NEW METHODS

88



That's because this latest BULLARD machine has many improvements that give you better workmanship and big savings in time and money.

#### No Other Shaft-Turning Lathe Offers All These Advantages

All 3 spindles are equipped with hydraulic, centering-type, lever-gripping chucks.

All machine-operating controls are located at operator's right.

Each hydraulic chuck is operated by an individual foot-treadle, allowing operator unrestricted use of both hands.

Both saddle and tool slide travel on vertical bearing ways, entirely free of the chip area.

An automatic feed interrupter breaks the chips to desired lengths for easy removal from the chip receiver.

Vertical construction of saddle and saddle ways allows chips to fall freely into receiver without accumulating around operating parts.

Work and tools are always visible and easily accessible to the operator without reaching across tool slide and tools.

Massive weight and firm application of all components provide extreme rigidity, assuring minimum vibration and maintained accuracy.

#### Plus the Advantages of BULLARD MAN-AU-TROL

Man-Au-Trol, the automatic control that is as versatile as manual control, has proved on other BULLARD lathes its amazing ability to cut production time and costs. Controlling the head through 39 separate functions in any sequence, it lets the machine cut practically continuously . . . while the operator merely loads, supervises and unloads.

Built into this new BULLARD machine, it allows manual control for short runs and quick conversion to 100% automatic operation for long-run production of 3 identical parts at once...substantially lowering manufacturing costs,

Why not find out how this revolutionary, cost-saving combination can benefit your own production? Engineering data and other facts on the new BULLARD Man-Au-Trol 3-Spindle Horizontal Lathe gladly sent on request. THE BULLARD COMPANY, Bridgeport 2, Connecticut.

TO MAKE MACHINES DO MOR

# Rubber Cushions Abrasive in Brightboy's Unique Surfacing Action



The resiliency of Brightboy's RUBBER, working in combination with abrasive, gives  $\alpha$ 

## WIDE VARIETY OF SURFACE EFFECTS FOR METALS, PLASTICS and WOOD

Use Brightboy for one-operation, close-tolerance, precision finishing, directly following the work of cutting tools and grinding materials. Reduce your production steps; increase product-quality!

#### YOU SAVE MONEY!

A Brightboy service representative will confer with you on your special finishing requirements; on your production planning. Your dealer will give you the Brightboy catalog-manual, and prices. Get this information now!

#### BRIGHTBOY

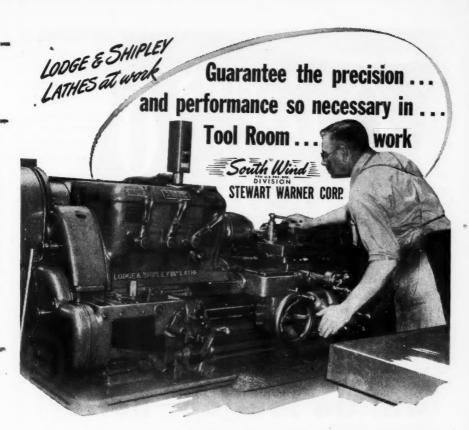
INDUSTRIAL DIVISION
Weldon Roberts Rubber Co.
Newark 7, N. J.



Burrs...Finishes...Smooths...Polishes

BRIDGES THE GAP BETWEEN GRIND AND BUFF

In One Operation



● In the illustration, a die punch to be used in the production of famous "South Wind" gasoline-burning auto heaters is being machined on a 16" Lodge & Shipley Tool-Room Lathe. This and other precision operations cause the owner to comment: "the foreman, as well as the operators, consider the Lodge & Shipley Lathe an excellent piece of equipment."

Forming tools, punches, screws and other lathes in action. Write for Condeprecision parts are produced on Lodge & log showing the complete line.

Shipley lathes in the South Wind plant. Operations including turning, boring, facing and threading are performed with carbide and high speed steel tools... hair-line finishing cuts can be made with extreme accuracy.

The chances are one of your industrial neighbors is an enthusiastic Lodge & Shipley user. Let our representative show you these fine lathes in action. Write for Condensed Catalog showing the complete line.



Lodge & Shipley

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### A PRODUCTO COST CUTTING AID

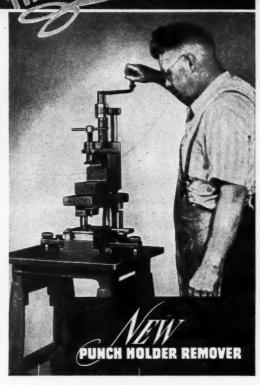
## SIMPLE... SAFE DIE SET SEPARATION

No need to waste valuable diemakers' time... or endanger expensive punches and dies. The NewPRODUCTO PUNCH HOLDER REMOVER does the job with the efficiency to be expected from a machine built for a specific use.

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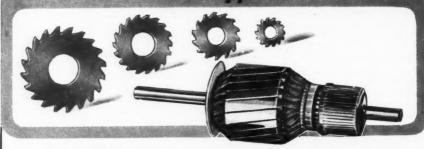
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Commutator slotting saws are made in diameters from  $\frac{1}{6}$ " to  $1\frac{3}{6}$ ", and from .010" to .045" thick. They operate at 5,000 to 6,000 R.P.M. and assure better work at these greater speeds! Complete price information available on request.

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TEMPLATES ACCURATE TO ±.002" PRODUCED WITH A WIEDEMANN R-43 IN A FRACTION OF TIME TAKEN BY ORDINARY METHODS New and revolutionary times have been set on accurate template making with the R-43 Micro Turret Punch Press.

The templates are punched, the hole size accurately maintained, and overall center distances held to ± .002". Two rotating turrets carry the required punches and dies, and thereby eliminate individual set up. A safety mechanism prevents tripping the press until the turrets are locked in alignment . . . shearing of punches and dies is eliminated.

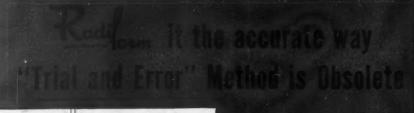
screws, with direct reading dials graduated in thousandths of an inch. assure easy positioning and accurate dimensions

The lead screws operate at right angles to each other, are absolutely square with each

Dimensioning can be done from the ends

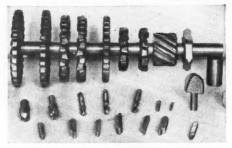
of the template or from the center lines.

The Micro Turret Punch Press is a method of production whereby all elements necessary to produce accurate templates, inspec-tion piercing templates and many types of flat drill jigs have been combined for maximum efficiency of motion and effort.





PATENT PENDING



Here are a few standard cutting tools that have been ground on the Radiform into special forms.

Radii can now be formed on spiral fluted end mills and similar rotary cutting tools. You will see pictured at the left the Radiform forming a 3/16" convex radius on a 3/4" dia. end mill. This attachment on the Radiform with its 24 station indexing head will save you time and money, and give you precision results you had never hoped for.

The Radiform generates forms on most types of cutting tools. Carbide form tools are no longer difficult to grind with a Radiform.

New, reduced prices for the Radiform have just been released. So write today for revised price list and complete information showing examples of how the Radiform can simplify your complex expensive grinding operations.

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made EXACTLY to
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Regardless of quantity or type, you'll profit by specifying Adams custom made gears for you: product. Made on the most modern gear cutting machines by skilled workmen, Adams gears are quality controlled to guarantee exact conformance to your specifications. Write for further information, today. THE ADAMS COMPANY, 1942 Cypress St., Dubuque, Iowa.

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T-J CUTTERS
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Do your cutting in tough die steels—at high speed—with T-J Die Sinking Milling Cutters! De-signed and built right for sturdiness . . . ability to hold a sharp edge longer ... and carry less breakage percentage. More work between grinds! Made from a standard, extremely high grade steel...better performance be-cause of extra strength, wear resistance and uniformity. Backed by 29 years of T-J experience. Write for catalog. The Tomkins - Johnson Company, Jackson, Michigan.

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HEAVY DUTY MODEL 10" x 10" to 20" x 20" capacities



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(Dry Cut)
MODEL
6" x 6" capacity

KACINE'S fully hydraulic metal cutting machines, using oil-cushioned feed and pressure, are fast, accurate and easy on blades. On each cutting stroke the blade teeth are progressively fed into the work. Ingeniously designed feed controls apply maximum feeding action with automatic relief to protect the blade against undue strain.

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Get our interesting catalog No. 12. See for yourself why RACINE equipment saves manhours, material, time and blades. Write today.

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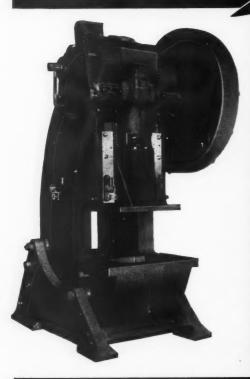
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# CLEVELAND Inclinable PRESS

# 150 tons Capacity



This big ruggedly constructed, compactly designed, No. 13-1 Cleveland Inclinable Press is arranged with an electrically controlled, air operated friction clutch and brake.

The Press, which exerts a pressure of 150 tons, has a stroke of 6 inches, adjustment 10 inches, bed area 30 inches x 45 inches and operates at 33 strokes per minute.

The Clutch, Flywheel, Brake and Motor are mounted between the uprights and the gears, which run in oil, are fully enclosed in oil tight guards.

Other Presses of this series include

11-I, 110 tons; 10-I, 90 tons; 9-I, 75 tons; 8-I, 60 tons and 7-I, 45 tons.

If interested in Inclinable Presses write for a copy of our Catalog

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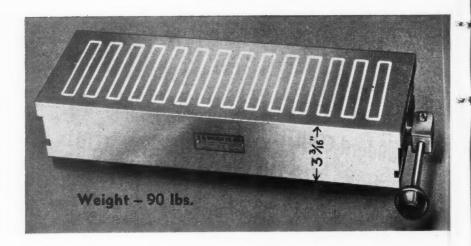
- relief can be produced. Dies from 3/8" up to 2" \* Equipped to give cutter speeds with infinite changes
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This WALKER Permo Chuck gives you headroom never before obtainable, increased holding power due to fine pole division. It is proving its worth in a wide scope of production on both light hand-operated or power-fed machines. Complete details yours for the asking.

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The improved, better cutting NEW GRIFFIN is a hand frame blade that is unique. Through the center its temper is soft but very tough. Its back and teeth are hard. Only Griffin makes this type of blade—your best buy for all general hand saw use.

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Hold knives or small parts firmly and to extreme edges of chuck with Hanchett's new, exclusive laminated top knive bar. Two types, many sizes.



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For faster, more efficient magnetic chucking — this new combination Rectifier and Demagnetizer will

help you cut production costs.

# Let Laminated MAGNETIC CHUCKS by Hanchett Set New Production Standards for You

The Hanchett magnetic chucking method lifts the limit off production speeds for parts machining. Check your shop for machining operations where chucking and set-up time cuts into profits. Find out whether completely automatic "hands-off" production would boost your net. Then drop us a card. We'll help you apply Hanchett Magnetic Chucking to your grinding, milling, drilling, shaping and planing operations.

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NO CLUTCH . . .
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NO LEAD SCREW

Suitable for 0-80 to %-16 taps, within limitation of 1725 RPM spindle speed.

Patented, centrifugal feed, suitable for any number of threads per inch without adjustment. Extremely sensitive feed.

Unit may be operated as high as 30 operations per minute.

Not a single purpose machine. May be used with any tap size within range.

This automatic tapping unit is completely self-contained. May be operated at any angle singly or in multiples, simultaneously or in sequence, or in conjunction with other equipment

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HASSALL cold-heading may solve your immediate special part problem... Special nails, rivets and threaded parts made in diameters from 1/32" to 3/8"—lengths up to 6"... Rivets 3/32" diameter and smaller a specialty... Variety of metals, finishes and secondary operations... Economy, quality and quick delivery in large or small quantities... Tell us what you need... We will answer promptly. ASK FOR FREE CATALOG. 3-color Decimal Equivalents Wall Chart free on request.

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Finger Tip Control opens and closes valve in a jiffy. No gripping effort as-sures easier, faster operation.



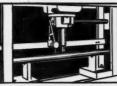
KRW Built-in Mechanical Press mits up to 3 tons pressure for straight-ening small diameter work.



One Piece, All Steel V-Blocks have machined surfaces for greater accuracy; usable upright or inverted.

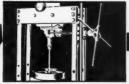


Highly Visible Pressure Gauges as mounted where they can be quickly checked. Read in tons and pou



Micrometer Dial Attachment permits great accuracy in checking work with-out removing from V-block.

#### Reduce Costs on these and other daily Production Jobs ...



Broaching a key way in a flywheel. 7½ inch ram travel makes many broaching jobs practical on KRW Presses.



Bending in production lots with simple, inexpensive dies is easily done on low-cost KRW Hand-operated Presses.



Pressing of all types is efficiently handled. Adjustable bed makes pressing on long shafts a very simple operation.



Riveting with KRW Riveting Attachment is simplicity itself. Many KRW Presses are used for this type work.



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—is designed for vertical downward pushing power. Rod extension is through the mounting base. May be mounted on any horizontal flat base in which an opening can be provided.

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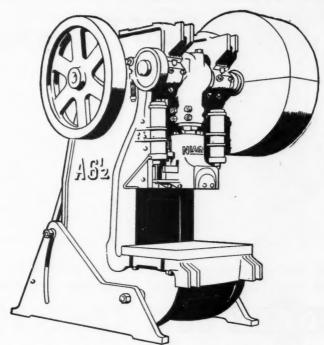
A NOPAK Model "D" Air Cylinder, used to operate the "hold-down" mechanism of this paper cutting machine, has increased its capacity substantially. Now, a quick flip of the NOPAK valve lever clamps and releases the stacks of paper, instantly, before and after cutting.

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# WHEN COSTS AND QUALITY COUNT THE New 918-S TURRET LATHE

If you machine small and medium sized parts from bar stock or on second operations — look to this new Rivett Turret Lathe. It is designed to buy its way into your plant with cost savings and quality control.

The 918S Turret Lathe cuts the initial cost of investment by taking work from larger machines. It follows by reducing the "dead time" of set-up and spoilage on

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Draw-in Collet — new disign holds work truer wis greater gripping power Maximum capacity: 11/2 round.

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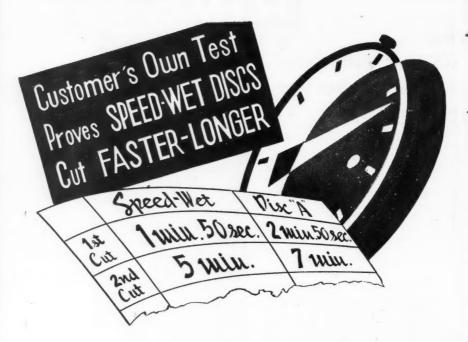
every job. Then it really pays with lowered time on every piece. How? — With the right spindle speed for efficient tooling, with quick means for chucking work, with properly grouped control levers and by reducing operator fatigue.

Features designed into the 918S Turret Lathe to guard quality include a rigidly mounted precision ball bearing spindle, precise tool indexing, hardened and ground steel bedways, vibration-free drive and mounting.

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# The New TURNER Multi-Speed POWER UNIT

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COMPANY MUSKEGON, MICHIGAN

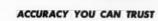


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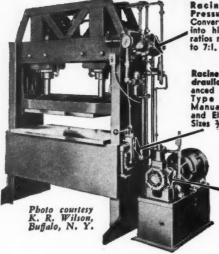
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# Machine Shop

OCTOBER, 1947

Vol. 20, No. 5

CINCINNATI, OHIO

#### This Month

With today's demand for oil greater than ever before in our history, oil well equipment engineers are playing an important role in making it possible to tap the vast oil deposits which lie far beneath the earth's surface. Theirs is the story of developing oil well drills that must withstand terrific wear and of recommending methods for accurately producing these tools. The feature article this month, "Tools for Oil," covers machining operations employed by Reed Roller Bit Company.

In the first of two articles under the heading "The Rubber Die Press as A Tool for Forming Aluminum", on page 144, Mr. E. R. Yarham presents data on British practice in the use of rubber press tools. Mr. Yarham explains that rubber press tools can be used to advantage in the manufacture of such articles as electrical fixture and appliance parts, radio parts, engineering sundries, toys, novelties and the like.

Years of experience in the use of carbides have shown that lapping is the best process for resharpening these tools, and it is well known that a correctly lapped cutting edge can be depended upon for much longer service, closer accuracy and a much finer finish than can be obtained from a ground edge. You will find fundamental information on the latest methods for tool-lapping in "Lapped Tools Do A Better Job!" Page 172.

The heat treating facilities at The Dayton Forging and Heat Treating Company are featured in "Electric Salt Bath Furnaces" on page 184. The reasons for the selection of the liquid salt bath furnace together with a description of its operation will furnish the reader of this article with a better understanding of the latest in equipment designed to do a complete commercial heat treating job.

A pictorial presentation showing important phases of railway spring manufacturing can be found on page 198. Under the title of "Springs Carry the Load", this article shows the various steps required to form, heat treat and test coil and elliptical springs.

The "Ideas from Readers" section beginning on page 202 presents the usual assortment of "homemade" tools and devices. Incidentally, if there is a "kink" or short cut in use in your shop, send us a description of it. We will pay for each acceptable idea that is published.

An advance report on the American Society for Metals Annual Meeting and National Metal Exposition is presented in "News of the Industry." You will find it on page 216.

Don't overlook the cartoon on page 380.

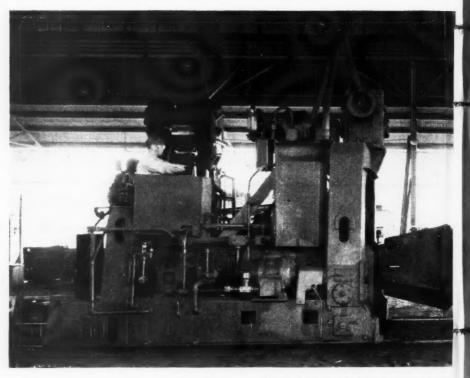


Fig. 1-Forging a drill collar for a Reed oil

## Tools for Oil

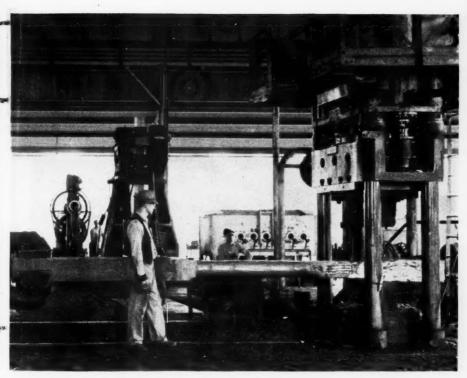
By C. H. ELLIOTT

Chief Industrial Engineer, Reed Roller Bit Co.

ONCE upon a time stouthearted adventurers were beguiled by the lure of gold—for gold throughout the ages has been the most precious of the metals and in all of the civilized world the standard medium of exchange.

Since the turn of the century a new breed of adventurer has been born the oil-well driller. The present-day world depends upon power, and power in these days of the automobile, the truck, the tractor, the airplane, and the diesel engine means oil. And oil, of course, means tools.

To start drilling a hole into the earth in the hope of finding oil the driller must be equipped with, first, a steel derrick from 140 to 180 feet high; second, complicated drilling tools, and third, the engines, pumps and draw



well drilling tool in a 600-ton hydraulic press.

Oil well drills must be good to withstand the terrific wear to which they are subjected in service. The Reed Roller Bit Company, Houston, Texas, presents some of the operations employed in the making of these tools.

works which provide the power to do the job. All of this equipment is set up so that, in the last analysis, a cutting tool can drill down through earth, rock, and whatever else the earth may contain in order to strike the sands in which the oil is imprisoned.

The production of tools for oil well drilling requires an understanding of

the job and the problems involved, the services of engineers who can meet these problems by the development of tools that will do the job and the methods for accurately producing these tools, and a plant equipped for the production of the tools that have been designed by the engineers. Such an organization is the Reed Roller Bit Company, Houston, Texas. Some of the

operations employed in the manufacture of Reed oil well tools are described in this article.

Oil well drills are of various types and designs; some are simply ground edge tools which operate something like a bottoming drill in metal machining; some have cutters which resemble bevel gears, each with many teeth and each rotating on a pin through the ax30 foot lengths, each of which has an external threaded tool joint on one end and an internal threaded tool joint on the other, so that any number of lengths can be joined. These lengths are added as the depth of the hole increases, but when it becomes necessary to "pull" the pipe for repair or replacement of the drilling tool, the lengths are usually unjointed at every



Fig. 2—Rock bits are forged from billets which are heated in the Hagan rotary furnace, conveyed through a hydraulic descaler, then to the steam hammer at the right.

is. The drill collar is the section used between the drilling tool and the many lengths of pipe by which the tool is held, positioned and rotated. This piece is forged to give it the strength necessary for the job, and is then bored, turned and threaded to provide means for attaching the tool. Drill collars are from 4 inches to 8 inches in diameter and from 20 to 50 feet in length, the largest weighing over 6,000 pounds.

The lengths of pipe from which the tool is suspended are usually made in

third joint, the pipe being stacked in sets of three sections. However, a well in the Houston area now has a derrick which is 180 feet high instead of the usual 140 feet, and during the drilling operations the pipe was pulled in sections of 4 lengths to a section, reducing the time required to pull the pipe by one-third. Considering that this well is approximately 10,000 feet deep, the amount of time consumed in pulling pipe to change tools was an important item.

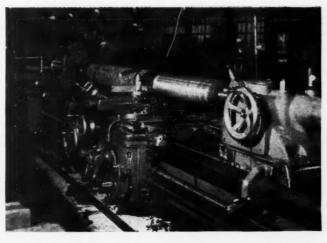
The illustration Fig. 1 shows the op-

Fig. 3—The time required for turning drill collars is reduced materially by using this Axelson lathe, which is equipped with two carriages.

eration of forging a drill collar for an oil well drilling tool. The forging is held in the jaws of an Alliance manipulator, with which it is moved forward

or back and rotated or held steady as required to produce the desired shape. The press is a 600-ton hydraulic press, controlled by means of levers in a control table at which the operator is seated in the rear of the press. Forged at white - hot heat, the billet requires some minutes for forging to approximately cylindrical form.

The Alliance manipulator travels on a track in the floor, and is powered by



electric motors driven by current taken from an overhead trolley. The jaws will grasp work up to 20 inches in diameter, either round or square. Considering that the forging operation is practically continuous in this plant, the manipulator is an invaluable assistant to the press.

Tools for drilling through rock, or "rock bits," as they are known, are made of forged steel in order to ob-

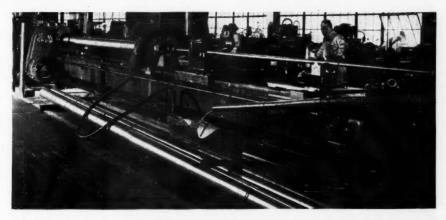


Fig. 4—The 2%-inch hole through the axis of the drill collar is drilled with the aid of a LeBlond gun drill. The operation takes approximately eight hours.

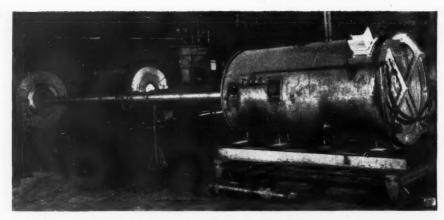


Fig. 5—The ends of the drill collar are heated simultaneously, using portable furnaces mounted on car-frames. The piece is oil-quenched in α tank in the floor.

tain the maximum strength for the grueling task to which the tools are subjected. Billets for forging into rock bits are heated to forging temperature in the Hagan rotary furnace shown at the left in Fig. 2, are then fed through a descaler, and are delivered by conveyor to the forging press shown at the right, where they are forged to the required shape.

The Hagan Rotary Hearth Forging

Furnace is annular in shape and rotates continuously while in operation. The hearth consists of a circular steel table faced on its upper surface with high temperature refractories and insulation. The table is supported by a series of cast steel wheels which are anchored to the foundation and which ride on a circular track attached to the under side of the hearth table. The wheels are mounted in Timken roller

bearings, and a radial thrust ball bearing at the center keeps the hearth centrally located.

The hearth is driven by means of a constant-speed motor through suitable reduction gears leading to a bevel gear mounted on



Fig. 6—Line of Lodge & Shipley Duomatic Lathes at work machining cross lugs for rock bits.

the under side of the hearth table. The speed of rotation of the hearth is controlled through an electric clock which can be adjusted to provide any length of heating cycle from 30 minutes to five hours.

The furnace is heated by gas burners stationed around the periphery and positioned to fire tangentially into the

time the table has made a complete revolution the first pieces placed in the furnace have heated sufficiently so that the white-hot billets can be fed to the hammer as fast as the operator can process them. As each heated piece is removed from the furnace, a new one is inserted.

Upon removing the heated piece

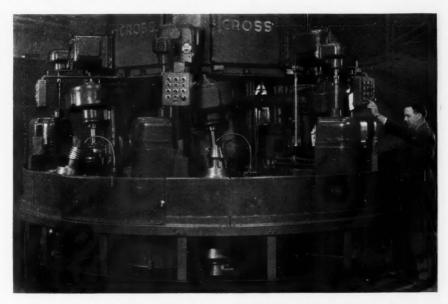


Fig. 7—Cross Six-Station Thread Miller being used to mill taper threads on cress rollers for oil well drills. The table rotates while the cutters are in operation.

heating chamber, producing a swirling flame which subjects all portions of the chamber to substantially identical conditions of heat. The furnace is equipped with one door, of the vertical lift type and arranged for manual operation, which serves for both charging and discharging operations. During periods of operation, the door is set at a height suitable to the product and allowed to remain open.

Upon starting the furnace at the beginning of the shift the workpieces are loaded onto the rotary table; by the from the furnace, the operator drops it upon a power conveyor which carries it into and through a hydraulic descaler which removes the scale and prepares the billet for the forging operation. The descaler is an important piece of equipment where hot forging is done as a production-line operation. The conveyor moves at a speed of 75 feet per minute and is continuous.

The operation of turning a drill collar is shown in process in Fig. 3. An Axelson lathe equipped with two carriages is used for this job, the duplicate tool cutting the time required for the job by nearly one-half over the previous method of using a single tool. The piece is 30 feet long and 7 inches in diameter; thus the saving in time is obvious. With the piece revolving at a speed of 30 r.p.m. and the tool feeding 0.060 inch per revolution, a ½-inch cut

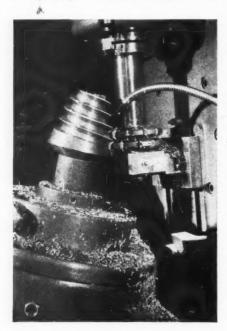


Fig. 8—Close-up view of cutter on Cross Thread Miller in operation.

is taken which, considering that this is press-forged 4140 steel, is a good cut.

A 2¾-inch diameter hole is drilled through the axis of the drill collar, extending the entire length of the piece. This operation is performed with a LeBlond gun drill as shown in Fig. 4. The drilling tool is fed 0.006 inch per revolution of the work, the piece revolving at a speed of 79 r.p.m. A copious supply of coolant is fed to the tool to keep it cool and to remove the

chips. The hole is drilled in approximately 8 hours.

To give the drill collar the maximum possible strength, 48 inches of each end of the collar are hardened. The ends are hardened simultaneously. which is made possible by the use of the gas-fired furnaces shown in Fig. 5. These furnaces, built by the Combustion Engineering Company, are mounted on frames which are equipped with flanged wheels so that they can be moved forward and backward on a track. Thus with the workpiece suspended by means of the overhead crane, the furnaces are moved in until each end of the collar is in heating position in the furnace.

The ends are heated to 1550 deg., then the collar is slung to the crane hook, the furnaces are backed clear of the ends, and the piece is lowered into an oil quench, which gives it the necessary hardness. The piece is later returned to the furnaces to be drawn to 1150 deg., which relieves the strains and imparts to the piece the toughness required.

A view of the machine shop of the Reed Roller Bit Company is presented in Fig. 6, where a line of Lodge & Shipley "Duomatic" lathes can be seen positioned so that they can be served by a roller conveyor. These lathes are used to machine cross lugs for rock bits, or drilling tools.

More than 75 different types and sizes of cross rollers for oil well drills can be machined in the Cross Special Six-Station Thread Milling Machine shown in operation in Fig. 7. The machine was built by the Cross Company to meet the requirements for production-milling the spiral flutes in cross rollers, and the outstanding feature of the design is the combination of full automatic operation with great flexibility, easy operation and short set-up time.

The great flexibility of the machine is indicated by the fact that each of

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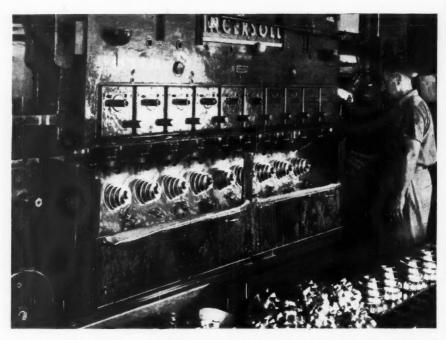


Fig. 9—Special-Design Ingersoll 10-Spindle Milling Machine milling a constant tooth in a conical helix on each side of 10 pieces, machining the 10 simultaneously.

the six spindles can be set up on entirely different parts in which neither cone angle, lead nor helix need to be alike, yet full automatic operation of the machine will still be possible. This procedure is not followed normally, but nevertheless it can be adopted should the pressure of small rush orders make such a set-up desirable.

Each work-head can be rotated to obtain the desired cone angle, which is indicated by a direct reading on a graduated dial, and each cutter head is likewise rotated to obtain the correct helix angle setting for the milling cutters. Double-thread flutes can be milled by using two milling cutters on the arbor, or by using a single milling cutter and indexing the work-holding device 180 degrees.

Operation of the machine is ex-

tremely simple. The entire machine revolves and thus brings each milling station in turn past the loading position. At this point the operator releases the expanding mandrel by means of a hydraulic valve, loads a new piece onto the mandrel and closes it, presses a button which indicates to the machine that his work has been completed, and the milling cutter automatically feeds to the work and starts its cut. If the cycle button is not pressed by the time the other cutters have completed their work, the machine will automatically stop. Normally the machine never stops unless stopped for some specific reason, the operator having ample time to reload the machine as each station in turn passes his position. A close-up view of a cutter in operation is shown in Fig. 8.



These powerful Cincinnati Bickford Super Service Radial Drills handle easily, and operator has complete control through levers placed low on the head. Eighteen feeds and 36 speeds insure the right feeds and speeds for the job.

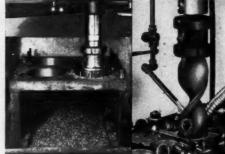
Write for a complete description of the production, safety and special design features of these machines in Bulletin R-24-A.

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October, 1947

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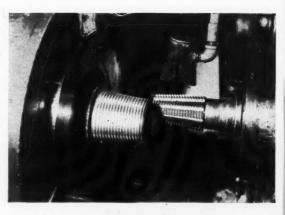
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MODERN MACHINE SHOP

Fig. 10—Milling a thread on a tool joint. The machine is a Lees-Bradner thread miller.

The machine shown in Fig. 9 is a "special design Ingersoll 10-spindle milling machine" designed by the Ingersoll Milling Machine Company to meet the problem of milling a constant tooth in a conical helix and doing the

job on a high production basis. The machine had to be flexible enough so that the many different sizes and shapes of cutters required for the various geological formations could be accommodated as to cone angle, pitch of teeth, amount of skew, depth of cut, and several other variables. It also had to be readily changeable from one setup to another. Furthermore, it was necessary that the machine be semi-automatic and governed by controls



simple enough to be handled by the average machine operator.

The Ingersoll machine is a classic example of the manner in which specially-designed equipment can be applied to solve a problem that cannot be solved with machines of standard or conventional design. This machine, by utilizing ten spindles, produces more on this operation than could be produced by ten of the standard-type machines previously employed.

The "tool joint" is a forged steel connection used between the pipe and the drilling tool, and although of comparatively simple design, must be accurate in every detail. It is threaded externally on one end and internally

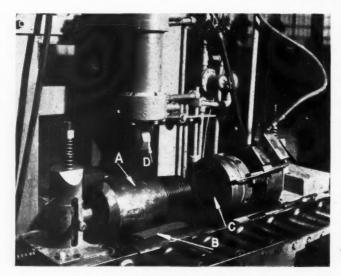


Fig. 11 — Equipment used to inspect a tool joint for accuracy and "stand-off" of thread.

EXTRA CLAMPING SURFACE HERE... Photo courtesy of Marion Machine Foundry & Supply Company Some castings are bulky and awkward to handle.

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Often they present a setup problem, as it may be difficult to clamp them firmly to the regular shaper table.

The large area of the Cincinnati Supplementary Table Top saves setup time, and the full clamping improves the accuracy. It is applied easily and widens the use of Cincinnati Shapers. It is just one of the many useful accessories available.

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Fig. 12—Using a gas torch, hard metal is brazed to the sides of an oil drill cutter.

at the other. The operation of milling a thread on a tool joint is shown in Fig. 10, a Lees-Bradner thread miller being used for the job. This piece is known as a  $5\frac{9}{16}$ -inch joint, and is 5 inches in diameter at the small end. The thread is 4 pitch, cut on a taper of 2 inches to the foot. The milled thread has a good finish and is accurate both as to size

and lead. The accuracy of the thread on the tool joint is determined by the aid of the equipment shown in Fig. 11. The joint, A, is positioned on power-operated rollers B. With the joint spinning at a high rate of speed, it is fed forward to mate

with the thread in the collar C. When it has reached full depth. it stops and the power is shut off. A feeler gage is used to measure the gap between the facing surfaces of the collars on the mating pieces. To

separate the pieces, the pressure to obtain the necessary friction is applied by the roller D on the end of the piston in the air cylinder E and the power-operated rollers are reversed.

To enable the rock drill cutters to withstand the grueling service to which they are subjected, hard metal is applied to the sides of the cutters

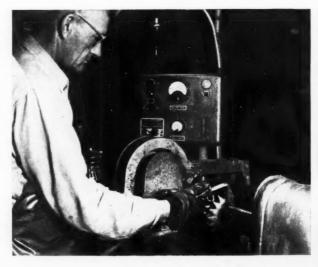


Fig. 13-The Magnaflux method is used to determine the soundness of a cross roller for a rock bit.



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by using a gas torch as shown in Fig. 12. In his left hand the operator holds a section of steel tubing containing granulated tungsten carbide; as the tube is melted by the heat of the torch,

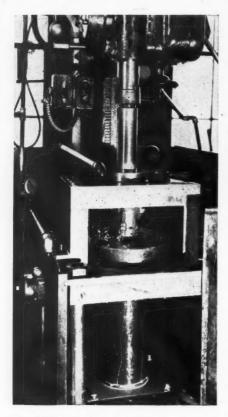


Fig. 14—Set-up for counterboring a "super shrink grip" tool joint on a drill pipe, using a Cincinnati-Bickford vertical drill and a special fixture. Limits on concentricity and diameter are 0.003 inch.

the carbide is imbedded into the surface of the cutter. This cutter is 13% inches in diameter and has 26 teeth, all of which must be hard-surfaced in the manner described.

The failure of a cutter when drilling at a depth of several thousand feet

is an expensive contingency, consequently every possible means is employed to make sure that the tools are in perfect condition when they leave the Reed factory. The Magnaflux test is one of those employed to determine the possible presence of flaws or cracks in the tools. The operator shown in Fig. 13 is using the Magnaflux to determine the soundness of a cross roller for a rock bit.

In the Magnaflux test, the workpiece is bathed with a solution containing a quantity of minute iron particles while an electric current is induced in the piece. If the piece contains a flaw, such as a minute crack, the filings will align themselves so as to form a pattern parallel with the flaw, and the flaw is immediately apparent. All side-cutters and cross rollers are subjected to this test before being assembled with their mating parts.

The tooling shown set up in Fig. 14 is employed to counterbore a "super shrink grip" tool joint. The counterbore must be perfectely concentric with the thread in the joint, also perfectly square with it. To ensure such accuracy a highly accurate and rigid machine tool is used (in this case a Cincinnati Bickford vertical drill) and the counterbore is equipped with a pilot which is a close sliding fit in a pilot bushing which locates on the thread in the joint. The shank of the counterbore consists of a shaft which is also piloted through a bushing in the fixture, thus assisting in maintaining concentricity. When the tool joint has been set up in position for operation, the spindle, carrying the boring bar, is fed downward until the tool has reached the correct depth. Limits on concentricity and diameter of the counterbore are 0.003 inch.

A typical roller bearing roller for a rock drill is centerless ground to a diameter of 0.4325 — 0.4330 inch and to a length of 1.480 — 1.484 inch. In-

# Cutting out the "chatter" improves quality



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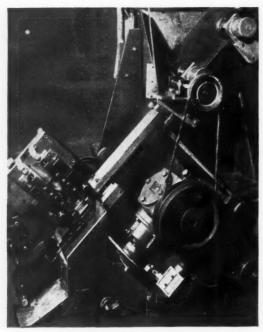


Fig. 15—Rollers for roller bearings are automatically inspected for length and diameter in this Sheffield Bearing Checker. The selector will check and segregate 3,600 pieces per hour into four classifications.

asmuch as such rollers are manufactured by the thousands, but must be within the limits specified, an automatic inspection device is employed which checks the dimensions and automatically separates the good pieces from the bad ones. This device, shown in Fig. 15, is a Sheffield Bearing Checker, or "roll selector."

The rollers are fed into a hopper at the top of the machine from which they slide by gravity feed to gaging position. The gaging is done by electrical contact, one "Electrichek" gaging head checking the overall length of each piece in turn while two other gaging heads check the diameters at each end. During the gaging process each roller is segregated into one of 4 classifications; parts within tolerance limits, parts with diameter within tolerance limits and length oversize, parts within tolerance limits and length and

diameter oversize, and parts oversize on either or both diameter and length. The parts are automatically dropped into separate bins according to their classifications.

The roll selector operates at a fixed speed and will check and segregate 3,600 pieces an hour into the four classifications while gaging the three dimensions simultaneously. The covering hood has been removed from the checker shown in the illustration so that the operating parts can be seen.

The efficiency of our present-day fast-moving civilization depends greatly upon our ability to produce oil in quantities and at depths of drilling never before attempted. With good tool engineers on the job, we are assured of an adequate supply far into the future.

Pratt & Whitney Model "C" 11/4 x 18-Inch Full-Automatic Lathe. Pratt & Whitney, Division Niles - Bement - Pond Co., West Hartford 1, Conn., now has available an eight-page profusely illustrated circular presenting a complete redesign of its Model "C" 11/4 x 18-Inch Full-Automatic Lathe, and also containing a reference to its companion product, the Pratt & Whitney Full-Automatic Centering Machine. Typical jobs automatically performed on the lathe are illustrated and discussed, and descriptions and illustrations are provided of various accessory equipment available for the machine, as well as a table of specifications. Copy of Circular No. 492 free.

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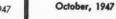
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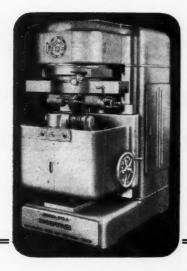
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### MICHIGAN TOOL COMPANY

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## The Rubber Die Press as a Tool for Forming Aluminum

Data on British practice in the use of rubber press tools

By E. R. YARHAM England

SINCE its introduction to industry, about a decade ago, the use of rubber as a tool for forming aluminum and aluminum alloy sheet has developed rapidly. Rubber has proved especially valuable where many varieties of shapes and sizes of components are to be produced in quantities that do not warrant the use of hardened steel tools of a permanent nature, and its simplicity makes possible the employment, when necessary, of semiskilled labor.

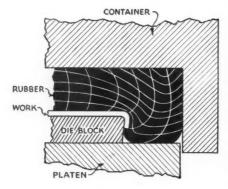


Fig. 1.—Drawing illustrating action of rubber pad in operation of rubber die press.

During the war years the rubber die press was principally used in the aircraft industry, not only because it was (and still is, of course) admirably suited to the production of many kinds of aircraft components, but also because the shortage of rubber restricted its application to essential industries. The possible field of application is very wide; rubber press tools can be used to advantage in the manufacture of such articles as electrical fixture and appliance parts, radio parts, engineering sundries, toys and novelties and the like.

Simple blanking, piercing, forming, shearing, flanging and drawing operations may all be performed by the rubber die process with a minimum of outlay for tools. The following data, supplied by the Aluminum Development Association of Great Britain, pertains to the technique of the process as practiced in that country.

The rubber die press consists essentially of a thick rubber pad, housed in a steel container strong enough to withstand the maximum pressure exerted on the platen of the hydraulic press or other machine with which the rubber die is used. The thickness of the

rubber is about two-thirds the depth of the container. The punch, which actually determines the shape and form of the blank, is made from sheet plywood, zinc or steel. The rubber die press is placed on the press platen, and remains there throughout the run.

In operation, the sheet material to be formed is positioned on the die,

where it is located by means of locating pins. The punch is then placed in position on the sheet material and the press is put into operation. As the hydraulic pressure increases, the punch forces the sheet material against the rubber pad which, when deformed, compels the metal to shear or form to the shape of the die.

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tion of the operation is impossible. The frictional properties of the rubber also have considerable influence on the working action of the rubber pad, since the process is a dry one and is achieved by a combination of stretching and displacement.

Very little slip takes place, and such slip as occurs takes place over

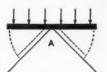




Fig. 2—Bends should be formed by external action as shown at A, rather than by internal action as indicated at B. Note, at B, the difficulty of obtaining a sharp corner.

Until comparatively recently, it was generally accepted that the use of rubber in conjunction with press tools was dependent upon the ability of the rubber to flow; i. e., that when pressure was applied to a quantity of rubber confined in a closed vessel or container the resultant action was set up on every surface with which the rubber came into contact. At the same time it was noted that, in contrast with a purely fluid medium such as water, rubber possesses the property of cohesion or resistance to "free flow."

Now, however, it is believed that the fluid-like flow of rubber is negligible, and that it is the frictional properties of the rubber that are most important in the forming of components by the use of the rubber die. In other words, the ability of the rubber to react under pressure in such manner that it can be applied to the forming of sheet metal parts is due to the resistance of the rubber to deformation.

The pressure obtainable is limited by the shear strength of the rubber; once the rubber begins to shear, the pressure falls so rapidly that comple-

the vertical surfaces-never over horizontal—as may be determined by placing spots of wet paint upon the metal to be processed. It will be found that the paint spots are transferred to the face of the rubber pad without appreciable smearing. The face of the rubber pad clings by friction to the surface of the material at the point where it first touches the metal and remains at that spot even when full pressure is applied, the more distant parts of the rubber pad being displaced and stretched over the work and punch. The action of the rubber is illustrated in the drawing Fig. 1.

Although most modern rubber dies have been designed for use with high pressures, a considerable amount of work on sheet from 14 to 20 gauge is produced with low pressures. However, the dies for use with low pressures are of somewhat more complicated design than those intended for high pressures, although for many applications the saving in power may make them more economical.

Good work may be produced in small presses with as little as 150 tons capacity, but most hydraulic presses

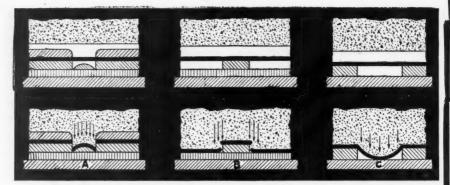


Fig. 3—Drawing illustrating methods of making effective use of pressure area. A—Area available to pressure is at hole only.

B—Showing method available if rough edges are permissible. C—
Illustrating method to be avoided.

of the type used develop between 300 and 600 tons pressure, with a platen pressure of 0.7 tons per square inch. The rubber pads used on these low pressure presses are either solid or built up from 1-inch laminations of 50 to 55 Shore hardness.

The internal pressure of this soft rubber is not always adequate to complete all forming operations, in which case the pressure is reinforced by mechanical means. An ironing plate made from 4-inch boiler plate, cut away in the center so that it just clears the finished outline of the component, is located on top of the blank material. When the pressure is applied, the rubber comes into contact with the surface of the plate and is forced into the openings, the rubber thus compressed forcing the material to the shape of the die. The ironing plate greatly helps in preventing the formation of wrinkles at the corners of the part.

Unless large parts of heavy gauge are required, the low-pressure type of press with moderately soft rubber will form practically all standard parts of normal size. The press has a very rapid cycle, particularly when designed to accommodate four loading tables.

Two types of hydraulic presses,

standardized by the British Ministry of Aircraft Production during the recent war, are in general use in Britain; one a high-power press of cast steel unit construction, the other a low-power press of mild steel plate construction. In the high-power type, units of about 2,670 tons rating each, with a platen area of 3 x 4 feet, are coupled together to form presses rated at 5340, 8000 and 10,700 tons respectively, with a maximum pressure of 11/2 tons per sq. in. Working dimensions are, respectively, 6 x 4 ft., 9 x 4 ft., and 12 x 4 ft. The low-power type is built in sizes ranging from presses of 500 tons capacity with platen dimensions of 3 x 2 ft. to machines of 2.600 tons capacity with platen dimensions of 6 x 4 ft., pressures in all cases being 0.5 tons per sq. inch.

In a typical high-power press the rubber pad is 9 x 4 ft. x 10 in. and is housed in a steel container, being vulcanized to a steel plate in which tapered holes have been machined to provide a firm anchorage. The plate is easily removed for renewal of the rubber pad. The platen, mounted on the cross-head of the cylinders, is fed upward into contact with the rubber by means of a series of hydraulic cyl-



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The value of the "American" Hole Wizard's concentrated control at the bottom of the head is clearly demonstrated by this job.

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inders which distribute the pressure evenly over the whole area. Forming dies are grouped on the platen with not less than 2 inches between the dies.

The press is provided with two loading tables carried on rollers mounted on ball bearings and either table, when loaded for operation, may be run onto the platen. The rollers on the platen are spring-loaded so that as soon as the rubber is engaged the load is transferred from the rollers to the platen. The tables are moved in and out of the platen by means of a friction drive.

The press is controlled electrically from a control panel; a single lever controls the operation of the press and a lever for opening the safety doors is provided at each end of the platen. These doors are connected with the main control lever so that the press cannot be operated until and unless both safety doors are closed.

This type of high-power press is capable of exerting a pressure of 1.5

tons per sq. in., which is sufficient to bend 10-gauge heat treated alloy sheet. The majority of components, however, can be formed at much lower pressures than this. Most parts can be formed at a pressure of 0.7 tons per sq. inch.

The low-power press is of welded design, being made from mild steel plate approximately 11/2 inch thick. Power units and driving cylinders are considerably lighter than those in the highpower unit press and the whole may be erected much quicker. The loading system consists of four tables, two being loaded at each end, the platens being moved to position and then power fed onto the crosshead of the cylinder in turn. The inactive time, in proportion to the active or working time, is thus reduced. Otherwise the method of operation is the same as with the highpower press.

The pressure applied in the low-power press is approximately 0.3 to 0.4 tons per sq. in. and the type of die



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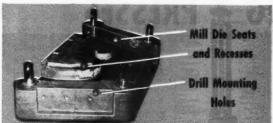
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used is therefore the same. The action can "dwell" at any point of the stroke if required, which greatly helps the production of components of complicated design. The cycle time for the 2,650-ton capacity low-power press is five minutes for a complete operation, each table being processed.

#### **Method of Using Rubber Die**

As stated earlier in the article, the rubber pad is housed in a steel container strong enough to withstand the total bursting pressure exerted by the platen, the thickness of the rubber being about two-thirds the depth of the container. The dies are grouped upon the surface of the platen, then the blanking material is placed in position on the dies, where it is located by means of pins. With the rubber pad positioned over the sheet material, either free or attached to the press-ram, pressure is then applied to the setup

by means of the ram.

The steel container prevents lateral movement of the rubber, thus forcing it against the material and forcing the material, in turn, into the openings in the dies. As the pressure is continued, the material is sheared or formed, as determined by the design of the dies. Upon removal of the pressure, the rubber assumes its original form, ready for the next operation.

If separate blanks are used for several components that are to be formed or sheared in the same operation, the blanks are located by locating pins in the dies. If dies of approximately the same height are grouped together, variations in the gauge of the metal used for the several components is permissible. When blanks for a large number of components are to be sheared, the shearing dies should be grouped so that they will use the full width of the sheet of stock and thus avoid excessive waste.



## Welded Steel Cuts Cost of Base 45%

By W. E. Benninghoff, General Manager TOCCO Division

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The Ohio Crankshaft Company, Cleveland, Ohio

BY thinking in terms of welded design for the fabrication of parts and assemblies of TOCCO Induction Heating Equipment, we have been able to benefit in two important ways.

1. Day after day, we use welded design in the development of work-handling fixtures and accessories for standard TOCCO machines and in the designing of special TOCCO machines. Each must be built to match a specific application. Welding permits us to use greater ingenuity and freedom in the design of this equipment and to manufacture quicker, at lower cost.

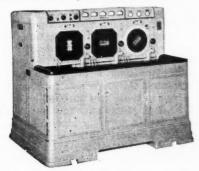


Fig. 1. Completed TOCCO Induction Heating Machine with former base.

2. In the manufacture of our standard TOCCO machines of all sizes and types, we use welded design for many parts to provide maximum rigidity and strength, lighter weight and lower cost. It also enables us to continually improve these parts because we are not restricted by patterns. The cabinet frame of the 150 KW TOCCO unit shown in Fig. 1 is an example of the larger welded steel parts which we have used for some time.

Recently we have also changed the base of the machine shown in Fig. 1 from cast iron to welded steel. The cast iron base weighed 3175 lbs. compared to 1180 lbs. for the welded steel base shown in Fig. 2. It was necessary to machine the top of the cast base to secure level mounting for the motor generator set. The welded base is



Fig. 2. The new welded steel base for 150 KW machine shown in Fig. 1.

sufficiently level as fabricated and requires no machining, thus providing further saving.

The total net cost saving with the welded steel base is 45%.

The base of this TOCCO machine supports a 150 KW high-frequency motor-generator, transformers, electrical controls and other equipment, housed in a steel cabinet. The total weight of the machine, including the base, is about 12,000 lbs. In service, it must be permanently level, rigid and have good vibration-dampening qualities.



Fig. 3. Schematic drawing of fabricated base.

The construction of the welded steel base is shown in Fig. 3. Made of standard mill shapes and plate, it requires a minimum amount of welding, resulting in close control of tolerances and minimum cost. It is proving highly satisfactory in performance in every respect.

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#### Dies and Tools

Die Design. Forming dies for use with the rubber die press are made to the shape of the interior of the piece to be formed. In many cases the dies are designed to combine shearing and forming in one operation. For instance; in aircraft fabrication on wing bulkheads, the forming of beads and lightening holes and the blanking of the part as a whole are done in a single operation, leaving only the forming of the flanges to be done separately.

Forming dies should be at least 1/4 in. thicker than the depth of the flange to be formed, and for most forming operations this amount is sufficient.

When designing tools for forming by the use of the rubber die press it should be remembered that parts can be formed by external pressure that could not be formed satisfactorily by internal pressure; i. e., forming should take place over a projection rather than into a recess. Where, for example, a shape is to be bent through an angle of 90 deg., if external pressure is applied with a forming block as shown in Fig. 2, relatively little pressure is required owing to the even distribution of the load and a close fit will be obtained at the apex A irrespective of how large or how small the radius may be at that point. Conversely, a bend obtained as shown at B calls for considerable localized pressure during the latter part of the forming operation and, even so, it may not be possible to obtain a good sharp corner at B without an additional operation.

Temporary Dies. For raising for forming flanges, stiffening ribs, lightening holes and so on, temporary dies of seasoned hardwood or red fibre may be used when only a few hundred components are required. If these materials are faced with metal, dies made of such materials will often produce several thousand pieces.

Flanging dies are in some cases



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made from a material known as "Jabroc," which is built up of Canadian birch veneers and impregnated with phenolformaldehyde, then subjected to heat and tremendous pressure. Supplied in boards of from 1/4 in. to 2 in. thick, this material has a specific gravity of 1.3 to 1.4 with a compressive strength of approximately 40,000 lb. per sq. in. and a Brinell hardness of 45. The working of this material is simple: it can be drilled, filed, or routed in the usual manner.

Permanent Dies. Permanent forming tools can be cut from mild steel plate at a fraction of the cost of hardened steel dies. Using a pantograph burning torch, mild steel plate can be cut to within 1/32 in. of the finish line, leaving a minimum for finishing.

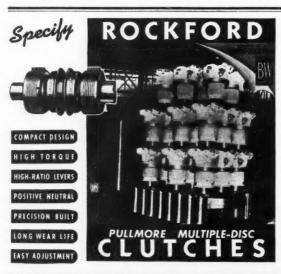
Steel plates, similar in shape to the die but slightly smaller in size, are sometimes used for cover plates, to prevent denting the material. When a cover plate is used, the blank that is

to be formed and the cover plate are positioned by means of locating pins.

Cast iron sides are also suitable for use when large tools are used, and especially where high pressures are involved. These dies can be lightened substantially by recessing them in the casting process.

Zinc Alloy Dies. The majority of the dies used in rubber presswork are made from zinc-base alloys, which are easy to work and possess good surface qualities. The alloy most frequently used consists of a mixture of 96 per cent zinc and 4 per cent copper. A temperature of 450 deg. C. is necessary for this alloy, with a contraction allowance of 1 in 120.

An alloy known as K-M alloy, recently developed and which has proved most satisfactory, consists of from 3.9 per cent to 4.3 per cent aluminum, from 2.5 to 2.9 per cent copper, and from 0.02 to 0.05 per cent magnesium, the balance being zinc of 99.99 per cent



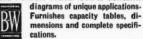
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STANDARD MODEL

Nichols Millers are built to the highest standards of precision so that tool room, laboratory, or production work may be produced to tolerances "in tenths." The Standard Nichols Miller is a manually operated horizontal type machine. It combines with all the conventional movements of table, saddle and knee a rise and fall spindle which allows the cutter to be brought to the work. This flexibility makes possible operations such as broaching, key seating and contour milling as well as regular milling.

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TOOL ROOM MODEL

The Tool Room Model is a standard Nichols Miller, equipped with a special table assembly providing greater working surface and increased longitudinal feed. Both longitudinal and transverse feed screws are fitted with hand wheels and extra large adjustable micrometer dials having easily read machine-engraved graduations. This machine is especially valuable in the tool room because of its compactness, generous capacity and ability to turn out a wide variety of extremely accurate work.

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The Standard Nichols Miller equipped with pneumatic table feed substantially increases its value as a production machine. The power feed, which operates on 75–175 psi is entirely automatic — the operator merely has to load and unload pieces and can with ease run two or more millers. Thus, output can be multiplied to a mass production scale while tolerances are held to "tenths."

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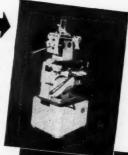
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Two Spindle Millers are most valuable for long production runs where simultaneous action of two cutters is practical. Two basic double spindle models are made, one with two identical spindles, and the other with two opposed spindles. These millers, available with hand or power feed, will be built or modified to suit the individual user's requirements.

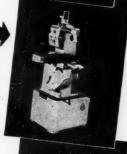
For complete details and information write for the booklet, "The Miller that Uses Its Head".

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purity. Most dies for components with flanges up to 11/2 in. in depth can be manufactured from sheet 1 in. thick. The material is relatively soft and can be worked on normal wood-working machines.

Unless used consistently at high pressures, zinc does not spread under pressure, but it is advisable to strengthen large dies by the addition of a 10 ga, mild steel bed plate. Open-end dies should always be fitted in such manner as to overcome the tendency of the rubber to force the ends apart. Where the maximum pressure does not exceed 0.7 tons per sq. in., the life of zinc-base dies is almost indefinite.

Zinc alloy dies may either be cast or made from sheet metal. When made from sheet, the first step is to scribe and cut to shape a form template of 10 ga. mild steel. The template is then used to lay out a section of zinc alloy sheet, which is trimmed with a bandsaw to produce a rough die blank. The

blank is then trimmed to size with a spindle moulder (router), the cutters being of such shape that the radius required on the top surface is machined in the same operation. Tooling holes are drilled from the template and bushings are set into the zinc alloy die at the correct positions. Accurate location of these holes is essential since the accuracy of the finished component depends upon them.

To make the pressure plate, which is located on top of the jig to prevent bucking of the web of the component when under pressure, a duplicate of the template is made from 10 ga. mild steel plate. Tooling holes are drilled in this duplicate, and the edges are

chamfered for safety.

LIBERT MACHINE COMPANY Green Bay, Wisconsin

Radii on dies should be as large as possible in order to avoid cracking of the work-material. A radius should be equal to three times the thickness of the sheet in process; a point that is particularly important when alumi-



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Small hole tapping (from the smallest and finest tap to 10-32 inclusive) need not be involved. With the Hamilton Super Sensitive Tapping Machine small hole tapping becomes routine. "Foolproof" in operation, the newest employee can become expert during the first day.

Patented power transmission and adjustable stops permit tapping of blind holes to the very bottom without tap breakage. Spindle idles in reverse while hap is being centered. Pressure to hand feed lever changes spindle rotation and engages tap. Release of pressure reverses and withdraws tap.

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num-alloy sheet in an aged condition is being flanged. Shearing dies, which can be made from compressed composition material such as "Jabroc," faced with chrome-molybdenum steel plate to form the shearing edge, are backed to an angle of 6 degrees.

When several dies are assembled on the platen to produce a variety of pieces, it is unnecessary that they all be of the same thickness since the hubber pad will adapt itself to variations in depth if the differences are not too great. However, when dies of different heights are assembled on the platen, it is important that they be as far apart as is practicable in order to allow the rubber, in deformation, to reach the surface of the platen in the spaces between the dies.

When the working pressure per square inch on the platen is not high enough to "set" the metal and prevent spring-back after the pressure has been released, the die-face may be backed-off in order to compensate for the elasticity of the material: 4 deg. backing is usually sufficient. greater the power of the press and the greater the pressure applied, the less the tendency of the material to return to its original shape when pressure is released. High strength alloys should be worked in the softest condition possible, but with some of the softer alloys and pure aluminum it may be preferable to use material in the quarteror half-hard condition.

#### Physical Characteristics of the Rubber Matrix

Hardness of Rubber. Rubber compresses only to an extraordinarily small extent—only about 0.04 per cent per 100 lb. per sq. in.—but displaces very readily. It has a relatively high "yield" range or elongation, varying with the hardness. Hardness is quoted in terms of Shore hardness—a term derived from the results obtained with

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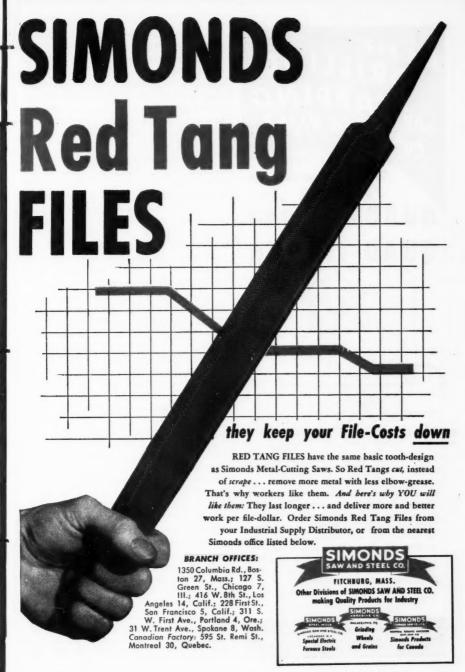
the Shore Durometer. Hardness as determined by the use of this instrument is quoted in degrees, the softest type of rubber, which has a gelatine-like texture, having a Shore hardness of 15 to 20 while very hard rubbers of the ebonite and vulcanite type have hardness figures as high as 95 to 100.

In the manufacture of tooling rubbers, a wide range of hardnesses and elongations is produced. Where hardness is concerned, the following considerations must be remembered when rubber is selected for a particular job. A soft rubber displaces more readily under pressure than a hard one, and reduces the working stresses in the early stages of the operation. At the same time, the displacement may be too rapid for pressure to be exerted where and when required and the flow of metal may therefore be impaired.

In some cases, the rapidity of displacement of the rubber may force the rubber behind the half-formed portions of the work before deformation has been completed. Conversely, a rubber that is too hard tends to "bank up" and displaces too slowly, so that even under maximum pressure complete deformation is not achieved. When this occurs, parts of the work are unformed and are, therefore, spoiled.

It has been found that rubber having an elongation of 350 to 650 per cent is suitable for all operations performed with the rubber die press. In terms of hardness, rubber with a Shore hardness of from 50 to 60 is recommended for drawing operations, hardnesses of from 65 to 80 being considered best for forming and shearing, respectively. It is unnecessary to have a separate rubber pad fitted for each of these operations. One of a hardness of 70 to 75 can be used for general purposes, supplemented for shearing operations with a layer of hard rubber approximately 13/4 inch thick and covering the entire surface of the pad.

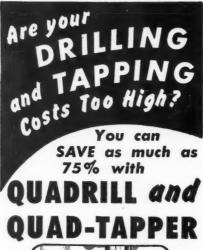


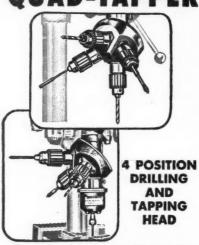


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For drawing, separate pieces of a softer rubber may be applied locally.

The factors most important in the compounding of rubber tools are resistance to abrasion, uniform extension throughout the mass, immediate recovery to normal after deformation, resistance to aging, and adequate tensile strength—about 3,500 pounds per square inch.

Durability of Rubber. The life of the rubber will be extended considerably if the pad is entirely confined in the pressure container and is not stretched beyond the elastic limit by excessive deformation when the working load is applied. It is important that the platen fit well into the pressure container, to prevent the possibility of the rubber being extruded around the sides and thus damaged.

It is possible to produce as many as 20,000 aluminum alloy components in a die of average design without appreciable wear on the rubber. Care should be taken to ensure that damage to the surface does not exceed 2 inches in a 10-inch block, since damage beyond this depth makes repair difficult if not impossible. Impaired surfaces may be repaired by grinding away the worn part and building up with a self- or cold - vulcanizing rubber compound. Best results are achieved by removing the rubber block from the press and returning it to the manufacturer for repair. However, provision is made in the "Fielding" press, shown in Fig. 1, for vulcanizing the uncured rubber additions without the necessity of removing the pad from the press.

Lubrication. The use of correct lubricants in rubber presswork, especially in drawing operations, is essential to avoid drag between the sheet metal and the die. Lubricants recommended are a non-abrasive powder such as French chalk or fine graphite. The powder should be dusted onto the metal sheet before pressure is applied. Oil or grease should never be used

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since both mineral and vegetable oils contain acids which attack the structure of the rubber and cause it to lose elasticity.

#### Technique of Rubber Die Press Work

Blanking and Piercing. When performing blanking or piercing operations in a power press, it is necessary only to calculate the energy required to overcome the resistance of the metal to be sheared; i. e., the shear strength of the metal multiplied by the area to be sheared. The entire available energy can then be concentrated at the points where it is required. The conditions change, however, when blanking is to be performed in the rubber die press.

In power press technique, shearing is due to the sudden impact of applied force. With the rubber press, the essential factor is pressure, and it is necessary to build up this pressure un-

til it exceeds the resistance offered by the metal. The pressure cannot be applied at a given point; it must be distributed over the whole area with which the rubber makes contact. Thus, in blanking with the rubber press, the principal consideration is the relation of the available hydraulic pressure to the surface area of the rubber pad and platen. For instance; if the hydraulic pressure is 1,500 tons and the platen area is 1.000 square inches, then the useful force is 1.5 tons per square inch, but if the platen area is increased to 2,000 square inches, the useful area is only 0.75 tons per square inch.

Consider, for example, a piercing job; it would be a simple matter, using a power press, to pierce a hole 1 in. long by ½ in. wide in duraluminalloy sheet of 24 gauge. The area of the metal to be sheared, in this instance, is 0.05 square inches. Assuming the shear strength of the alloy to be 15 tons per sq. in., it will be neces-

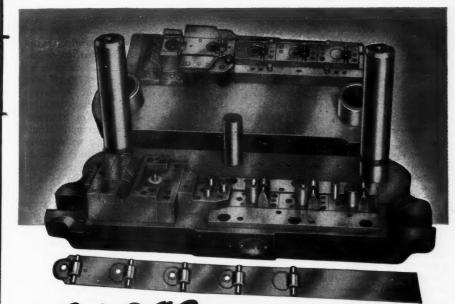


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sary to apply a force of over 0.75 tons. The available area in which to operate, however, is only 0.125 sq. in.; thus a pressure of 6 tons per sq. in. is necessary to pierce the hole satisfactorily.

While this task would be simple enough on an ordinary power press, it would be quite beyond the capacity of the rubber die press. In fact, a rubber press capable of exerting a pressure of 2 tons per sq. in. would be incapable of piercing a clean hole of  $\frac{5}{6}$  in. diameter in duralumin-type alloy sheet of 24 gauge, although it would produce a hole of somewhat smaller diameter having a rough edge, if the set-up shown in Fig. 3-B were used.

The problem is one of effective pressure area, as shown in Fig. 3. Using a tool of the design shown in Fig. 3-A, the effective area of unsupported metal on which pressure can be exerted is that of the hole itself. In the case of a hole of ½ inch diameter in duralumintype alloy sheet of 24 gauge, the

effective unsupported area is less than 0.22 square inch, which would require a pressure of 2.6 tons per sq. in. to provide a clean shear.

Where a hole having a rough edge is not objected to, a tool of the design shown in Fig. 3-B can be used, in which case the area of effective pressure, as shown by the arrows, would be about 0.6 sq. in. and a pressure of 0.86 tons per sq. in. would suffice. In calculating pressures for piercing, all figures must be based on the area of unsupported metal. For practical purposes, when using the rubber die press with an applied pressure of 2 tons per sq. in., it may be assumed that the effective area is that of a strip varying from 1/8 in. to 3/8 in. in width along the line of cut.

A type of set-up to be avoided is illustrated in Fig. 3-C. Although it affords a greater effective working area, this set-up results in torn edges instead of a clean cut. This method



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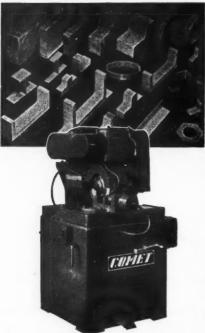
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should be used only with the heavier gauges of sheet, where there is less tendency for the metal to bend or become distorted.

The question of the amount of pressure required for piercing small holes is important, since it is the smallest hole in a component that determines the amount of pressure necessary for the production of that component. The real value of the rubber die press for piercing holes becomes apparent when a number of holes are to be pierced in a component.

For instance; using a power press, if a pressure of  $\frac{3}{4}$  ton per sq. in. is necessary to produce one small hole, then to punch 100 holes a power press of 75 tons capacity would be needed. Using a rubber die press, by economical grouping of blanks and dies on a platen of, say, 24 sq. ft., several hundred holes could be pierced in one operation with no more power required than would be required for the piercing of a single hole.

The rubber die press is particularly suitable for the production of flanged holes where clean holes are essential if the development of cracks is to be avoided.

(The concluding section of this article will be published in the November issue of MODERN MACHINE SHOP.)

"Metco News," Vol. 3, No. 11 discusses the variety of uses that a major oil refinery has made of metallizing over a 12-year period. This issue also includes a discussion on the copper metallizing of cast iron core boxes to eliminate core oil trouble in making castings; data on the solving of the problem of protecting the welding seams in steel barrels and drums through production metallizing; information on protecting aircraft engines against atmospheric corrosion and salt spray; and a "Technical Talk" on a method for improving the adhesion of sprayed metal to blasted surfaces.

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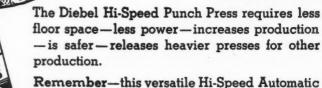
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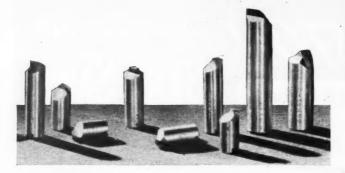


Fig. 1 — Carbidetipped tools, diamondlapped on a Heald
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# Lapped Tools do a Better Job!

ENGINEERS and scientists are constantly at work designing and developing mechanical units and accessories to simplify the more laborious tasks of the shop, the office and the home. Improved tools, improved materials and improved methods have all contributed to the achievement of this objective through making possible the finer accuracies upon which success, in the final analysis, depends.

The efficiency of many of these units such as, for instance, the electric refrigerator, depends upon accuracy as fine as 0.0002 inch, and the ability to work to such close tolerances on an economical production basis depends very largely upon the quality, cutting edge, and stamina of the cutting tools.

More than once a foreman has given vent to his enthusiasm over the excellent performance of an unusually good tool on a high production job with some such statement as "That tool we have on there now has been going perfectly for hours. It's the best one we've ever had on this job, and I hope we can duplicate it."

To inspire such enthusiasm it can be assumed that the tool was standing up beautifully, holding size and producing a fine finish. And why should one tool produce so much better than the tools that precede it? Because it

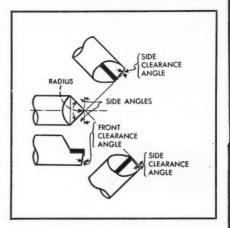


Fig. 2—Tool drawing showing design of tool with five angles and a radius, all of which are diamond-lapped and perfectly blended in a single setting of the tool-lapping machine.



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The same blades are used for all sizes of cutter bodies. They are furnished diamond-ground to a gage, ready for work. They are made in three types, for cutting steel, for cast iron, and for non-ferrous materials. The assembled cutter need not be placed on a cutter grinder. The blades may be re-ground individually on an ordinary wet carbide grinder. When the cutter is set up in the machine, blades may be lined up against the cut in the work.

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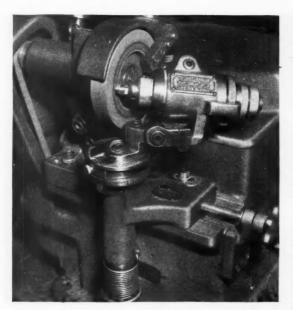


Fig. 3 — A single-point carbide tool can quickly be lapped to exact specifications in the Heald Tool Lapping Machine. It is only necessary to make a few simple adjustments and flick a switch, and the tool is correctly lapped, automatically.

was designed and ground to the proper shape, and was lapped to a perfect edge. However, it should be pointed out that proper grinding and perfect lapping cannot be achieved by hit-andmiss hand grinding.

If a tool is reground by hand, or if a duplicate is made by the hand method, the chances are that the shape of that perfect tool will not exactly be duplicated. Not only will the shape be altered, but the cutting edge will be irregular. Positive duplication of shape and absolute regularity of the cutting edge can only be assured by finishing the tool on a lapping machine of modern design.

To obtain maximum tool life and the best possible production, accuracy and finish on modern high-speed, high - production boring machines, using carbide-tipped tools, it has been proved that the essential requisites are (a)

correct shape and (b) maintenance of the cutting edge. Years of experience in the use of carbides have shown that lapping is the best process for resharpening these tools, and it is well known that a correctly-lapped cutting edge can be depended upon for much longer service, closer accuracy and a much finer finish than can be obtained from a ground edge. Also, to exact the last degree of efficiency from the cutting edge it must, of course, be lapped to the correct shape.

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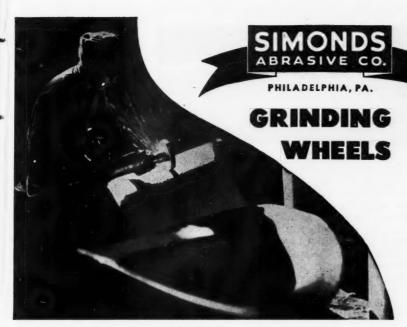
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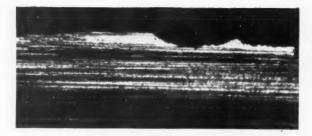


Fig. 4 — X100. Photomicrograph of carbide tool point ground free hand on a fine abrasive wheel. Irregularities in the cutting edge result in localized stress concentration, then breakdown of the cutting edge followed by rapid wear.

The only practical way to obtain the necessary accuracy and finish on a lapped tool is through the use of a machine especially engineered for the job, such as, for instance, the tool lapping machine shown in Fig. 3. This machine is a Heald Tool Lapping Machine, designed by the manufacturer to produce both of the essentials of shape and keen, sharp edge automatically, thereby eliminating the errors which inevitably creep in when a tool is sharpened "free hand."

In setting up this machine to sharpen a carbide tool—or a number of identical tools, if required—the necessary adjustments for angles, clearance, and so on are made and every tool that is processed with this setting has exactly the same shape and form as the original tool. As long as the setting remains unchanged, there is no variation in the finished tools.

The tool drawing Fig. 2 shows the design of a carbide boring tool with five angles and a radius. In a machine



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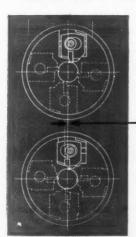
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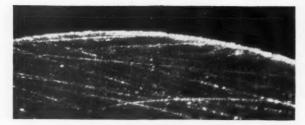


Fig. 5 — X100. Photomicrograph of carbide tool point lapped with fine grit diamond wheel. Note absolute regularity of cutting edge, which will result in longer tool life, better finish and higher accuracy.

of the type described here the five angles and the radius can all be lapped to a perfect finish in one setting and, what is more, any number of duplicate tools can be lapped to the identical form and finish. Thus when a tool becomes worn sufficiently to need replacing, a little care in the setting of the freshly-lapped tool will ensure continuance of dimensions and tolerances.

The photomicrographs Fig. 4 and 5 show why a lapped tool gives so much better service than a hand-ground tool. In Fig. 4 is shown a section of a tool

point that has been ground by the freehand method, using a fine abrasive wheel. The irregularities in the finish on the cutting edge will make possible an early breakdown of the edge, followed by rapid wear.

The photomicrograph Fig. 5 shows a section of a tool point that has been lapped on a Heald Tool Lapping Machine, using a fine-grit diamond wheel. The almost-perfect regularity of the cutting edge not only means that the tool will last much longer before starting to break down, but it also en-

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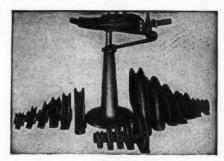
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MIDWEST MULTI-PURPOSE METAL CUTTING TOOLS are made to combine related operations into a single tool so that all the operations can be performed simultaneously. The operations may involve various combinations of milling, boring, counterboring, chamfering, facing or reaming. Many individual operation tools therefore, can be eliminated; the setup time saved. Such combinations invariably result in substantial overall economies on short runs or high production jobs.

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sures better finish and higher accuracy, all of which results in increased production and, of course, lower production costs.

(Illustrations courtesy Heald Machine Co., Worcester 6, Mass.)

"Grinding Carbide Tools" is the title of a 140-page pocket-size wirebound handbook published by the Norton Co., Worcester 6, Mass., which provides data on how to recondition and sharpen cemented carbide tools and cutters rapidly and economically. The contents of the book are divided into nine sections as follows: Wheels for Grinding Carbide Tools; Grinding Single-Point Tools; Chip Breakers; Hand Honing of Carbide Tools; Grinding Multi-Tooth Cutters; Miscellaneous Grinding Operations; How to Get the Most From Your Diamond Wheels; Centralized Control and Grinding of Carbide Tools; and General Information. Copy free to mechanical executives upon request.

"Better Broach It" is the title of a catalog now being issued by The Connecticut Broach and Machine Co., New London, Conn. Following a short introductory story of the company and its products is a section consisting of 10 case studies of actual broaching operations as now being performed by ten leading manufacturers. Each case study is a folded four-page form which includes a designation and photograph of the broached part, a photograph of the broach (or broaches) used, and a full description of the part, material broached, operation, and the broach itself. The center spread of the form contains a complete engineering drawing of the broach and part in blueprint reproduction. Page 4 includes a photograph of the machine and broach in operation.

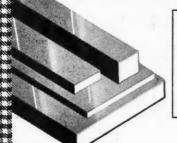
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In addition, there are 12 pages on the subjects of "What Can Be Broached . . . and Limitations"; "Length of Broaches"; "The Care of Broaches . . . Sharpening, Lubrication, Storing, etc."; "Information Required to Correctly Design Broaches and Quote Prices"; and discussion of pull heads and pull ends. Inside the back cover of this plastic bound catalog is an envelope which contains a 12-page book of the latest engineering data on broaching standards in table

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Precision - Master
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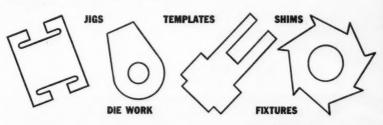
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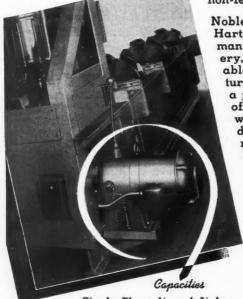
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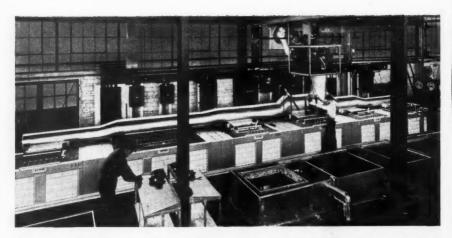
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1947

MODERN MACHINE SHOP

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Compact, streamlined and efficient, this battery of Upton Electric Salt Bath Furnaces furnishes complete heat treating facilities for all types of work done by the Dayton Forging and Heat Treating Company of Dayton, Ohio. Temperatures ranging from 300 deg. to 2500 deg. F., depending on the furnace and the type of heat treating done, are automatically controlled by the bank of electronic controls at the extreme right.

### **Electric Salt Bath Furnaces**

### Do Complete Commercial Heat Treating Job

THE installation of a battery of Upton Electric Salt Bath Furnaces for commercial heat treating work at the plant of a midwestern heat treating concern indicates an interesting trend in the type of equipment selected to provide complete heat treating facilities.

The concern, The Dayton Forging and Heat Treating Company of Dayton, Ohio, one of the most prominent forging and heat treating companies in the Middle West doing commercial heat treating, selected the liquid salt bath furnaces on the following considerations:

1. That the furnaces should be ca-

pable of doing virtually any kind of heat treating work that might be brought in. This means that facilities for all types of heat treating, requiring temperatures ranging from 300 deg. to 2500 deg. F., must be available with a heating rate of 500 pounds per hour for each furnace.

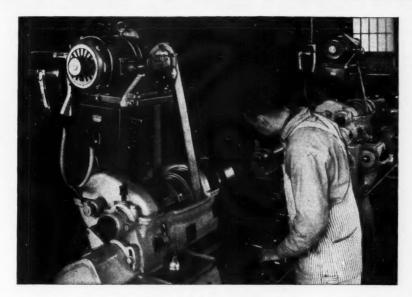
2. That work of the most intricate shape in the more unusual sizes be heat treated without danger of distortion.

3. That work should come out clean, scale free and above all, to have the exact physical and metallurigal characteristics required by the customer.

4. That the accuracy of such work

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MODERN MACHINE SHOP

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come well within the tolerances specified by the customer.

These considerations, plus the fact that the furnaces should be capable of operating without shutdown for any reason whatsoever during the working hours, and that they operate entirely automatically as to heat control to insure the results demanded, were factors that entered into the selection of the furnaces.

It was finally decided that six liquid salt bath furnaces would be sufficient for a complete range of heat treating work, covering all types of work that might be encountered. The furnaces are identified as follows:

Draw, Isothermal Quenching, Preheating and Neutral Hardening, High Speed High Heat, Quenching and Neutral Hardening and Carburizing.

With this single battery of furnaces, all the various types of work can be heat treated in one department. Such work includes hardening and drawing, isothermal treatments, high speed and high carbon high chrome steel using double pre-heat, stainless steel treatment, liquid carburizing and cyaniding.

To accommodate work of the more unusual size and to permit treating that work while it is suspended in a vertical position, thus eliminating the distortion or warping that usually results where work is heat treated while in horizontal position, each furnace was built with relatively small surface opening but to an unusual depth.

The surfaces of five of the furnaces are 9 x 27 inches in size. The isothermal furnace has an opening of 30 x 60 inches. All furnaces are built to a depth of 54 inches, but being installed below the floor line, they project only 30 inches above floor level, thus permitting maximum ease of working conditions for the furnace operators.

Such surface sizes, which are unusual for salt bath furnaces, are made possible by reason of the fact that the

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Atlantic's strong, practical box, plainly marked on sides and top. Remains in good condition until entire coil is used. Atlantic Saw Mfg. Co.

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electrodes for heating the salt in the furnaces are located—not at the top, as is customary—but at the bottom. The electrodes for each furnace enter through the brick work at the extreme bottom of the pot from opposite sides of the furnace. The electrodes extend only to a point flush with the inside surface of the pot, thus eliminating the danger of shorting or burning work should it be dropped.

The positioning of the electrodes in this manner eliminates the allowance that usually has to be made in the size of the pot to allow for work being put in or taken out of the bath. Thus, the top of the furnace is entirely clear.

An additional advantage of the restricted surface area is that heat radiation from each pot is reduced considerably. This, in turn, improves working conditions and permits operating the furnaces without the usual chain curtains. Instead of a fume ex-

haust hood of the usual type which when suspended directly over the furnace prevents use of a crane, a header pipe is employed, located along the back of the furnaces. An additional and important consideration is that, through the reduction of surface area, considerable power for heating the furnaces is saved.

### **Electrodes Sealed in Permanently**

It should be pointed out that the skill required to produce furnaces with electrodes permanently sealed in the brick work at the extreme bottom of the furnace must have been of a high order to assure the Dayton Forge Company that the electrodes would not be a source of trouble. Installed as they are in the bottom of the furnace, and with each furnace in a pit, removal of the entire furnace would be necessary before the electrodes could be changed.



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### Starting Coil

A unique means of "starting" furnaces which are built to unusual depths is by means of a starting coil. The use of such a coil precludes difficulty in starting a furnace that has been idle for a long period of time. The starting coil, which consists essentially of a chromel heating coil connected to bars which, in turn, can be attached to the transformer, is lowered into the furnace before the power to the furnace is shut down. Then, when the furnace is to be started up, the leads of the starting coil are simply connected with the output leads of the transformer, the power turned on, and the solidfied salt in the bath is thawed out in a short time. The heat generated by the starting coil, plus that from the standard electrodes is sufficient to permit returning the furnaces to operation.

All furnaces operate from 220 volt, 3 phase power. Each furnace is equipped with two water cooled transformers and has two sets of electrodes. These electrodes enter the furnace at opposite sides and are water cooled with the cooling circuit which cools the transformers.

### Temperature Control

Temperature control for all furnaces is automatic and, according to recorded charts, holds the temperature of each furnace throughout its entire depth to within 5 deg. of the temperature desired.

The controls for the five furnaces are Brown Electronic recording and indicating potentiometers. An extra themocouple and separate leads connect the individual furnaces with a Leeds and Northrup indicating potentiometer for periodic checking of the rurnace temperatures. The temperature control for the high heat furnace consists of a radiamatic head in conjunction with an electronic control.



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### **Bath Rectification**

In connection with the operation of the high heat furnace, a new principle of bath rectification has been thoroughly tried out and proved. An A. G. R. Graphite Rod is placed in the bath and is removed periodically, upon which it is found to be coated with globules of metal that have been formed by its action in reducing the metallic oxides in the bath to their basic metals. The rod is cooled, cleaned and returned to the bath immediately. The result of the use of the graphite rod in this manner is a clean, quiet bath with absolutely no trace of decarb. Apparently, this is an answer to the controversy among salt bath users concerning the efficiency of carbon versus graphite rod for high temperature salt bath rectification.

One of the most unusual features of the installation is the ceramic-lined carburizing furnace. This furnace, which is built exclusively by the Upton Furnace Company, is capable of cyaniding at temperatures up to 1800 deg. F. In common with all other furnaces in this installation, this furnace has the electrodes at the bottom of the pot. The use of the brick construction for a carburizing pot instead of the steel which is usually employed has proved advantageous as it withstands the attack of the carburizing salts so that the pot liner will not have to be replaced as in the case of steel pots.

Cincinnati "Filmatic" 6 and 10-Inch-L Plain Hydraulic Grinding Machines for use in grinding miscellaneous machine tool parts, hydraulic valve parts, aircraft engine and landing gear parts, automotive engine, transmission and steering mechanism parts, and so on, are fully illustrated and described in a 20-page catalog issued by Cincinnati Grinders Incorporated, Cincinnati 9, Ohio. Specifications for both machines are included. Copy of Publication No. G-566 free.

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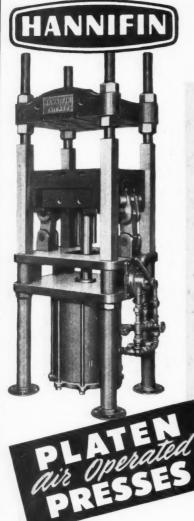
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Below: Interior view of a Multi Range Convection Furnace.



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### HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEYHOUTY ELECTRIC EXCLUSIVELY MILWAUKEE, WISCONSIN



Shown here are matched assemblies of steel plates, or leaves, made at the Crucible Steel Company's Spring Works in Pittsburgh, Pennsylvania. Each pyramid of plates is fitted to a pattern, and the elliptical springs are banded together. These springs are used on locomotives, tenders, passenger cars and cabooses.

# Springs Carry the Load

WITHOUT coil or elliptical springs, railroad rolling stock would be punished unmercifully in loading, transit and unloading. Passengers would be shaken and jarred even on good roadbeds, and sleeping on the train would be impossible. Freight, mail and baggage would be damaged or destroyed en route.

Spring designing and manufacturing in the United States has been developed into an industry which is a combination of complex engineering dealing with weight loads, locomotive and car design, train operations, stresses, strains, shocks and the "art" of handling hot steel.

One of the most modern of the American railway spring plants is the Spring Works of the Crucible Steel Company of America. A few views in that plant are shown here.

A Hot Bracelet. A band of red-hot steel (under worker's hands at right) is worked into place on a 21-leaf elliptical spring for a locomotive. These big springs are next put through a machine which shapes all four sides of the band and presses it tightly around the spring.



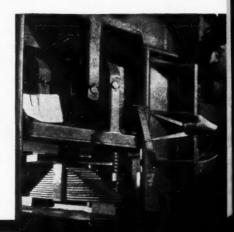


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ed th is, ig nt Out of an oil quench after coiling, and ready for further heat treatment, the springs shown in these cradles are still smoking after the tempering operation. These are the coil springs that can be seen on the wheel trucks of practically all railroad cars. Heat treating and tempering both before and after coiling gives these coils the resilience required for long service under heavy loads.

The testing machine shown here puts the crushing weight of 37,500 pounds on a 14-leaf elliptical spring that is to be used for the wheel truck of a locomotive tender. All Crucible Steel elliptical springs are tested to more than 50 per cent over their specified loads.





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tap at high speeds, these rugged precision tools require only about one-fifth the sharpening for the same number of holes, and are less easily broken.

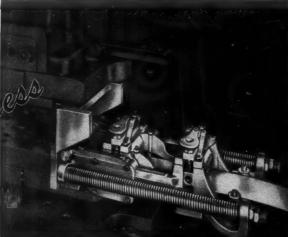
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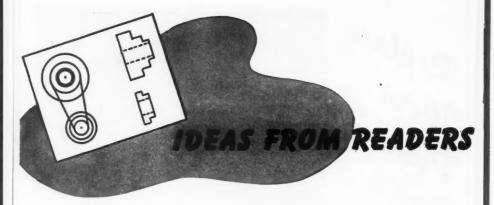
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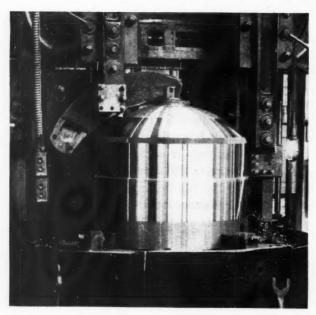
### Radius Fixture on Boring Mill

By A. R. McAllister
The Babcock & Wilcox Co.
Barberton, Ohio

ONE of the specifications of the 914 mm mortarshell used by our forces in the recent war called for 23.94 inch radius on the outside of the closed end of the forging. The various factors of weight of the workpiece, opportunity for combination cuts, and adaptability to the contouring cut led to the selection of vertical boring mills for the operation. To obtain the radius specified, a fixture was designed as shown in the illustration herewith and attached

to each mill.

The principle of the radius turning fixture is to have a ball bearing follower attached to the vertical ram, the follower being guided by a stationary cam mounted on the face of the boring mill column. Application of the horizontal feed with the ram free to float vertically resulted in the tool point



Turning radius on end of mortar shell forging, using vertical boring mill equipped with radiusturning device

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100 Foster St. 1448 Wabash Ave. Worcester 8, Mass. Detroit 16, Mich. travelling in the arc determined by the cam. Thus as the vertical ram, carrying the tool, fed horizontally toward the center of the workpiece, the ram was forced to follow the contour of the cam, which resulted in the tool cutting the required radius on the forging.

Necessity for having the ram free to float vertically while the horizontal feed was used resulted from the fact that the arc was more horizontal than vertical; had the arc been in more of a vertical position than horizontal, it might have been necessary to use the vertical feed and have the ram freed from the horizontal feed. It should be remembered that, as the tool travels along the arc, the actual feed will vary from the horizontal feed rate as determined by the tangential distance to the radius. This variation was permissible on this job.

Refinements included a screw operated vertical slide carrying the cam so as to permit adjustment as to the depth of the cut, also a sheet metal cover that traveled with the ram so as to keep chips from lodging in the cam.

### Spring-Backed Center Aids Metallizing Operation

(Courtesy Metallizing Engineering Co.)

MAINTENANCE and job shops that are equipped to do metal spraying can eliminate certain difficulties and save time by using a few simple accessories. Such an accessory is described in this article.

For spraying metal onto shafts or rolls, it is customary to use a lathe that may be too old to be accurate for ordinary machining work. During the spraying operation the workpiece is revolved at high speed, which often results in heating the work to a point





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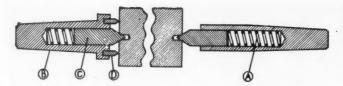
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Cross section drawing of spring-backed centers designed for use in metal spraying operations at Capital Transit Company, Washington, D. C.

which makes it necessary to back off the tailstock center. The tailstock center could, of course, be set loose at the start of the job, but the operator may miscalculate the amount of expansion and thus the center hole may be damaged or the tip of the center burned off before the operator notices that it has become tight during the expansion of the heated work. The noise of the spray gun will usually drown out the squeal of a dry or tight center.

Many shafts and rolls must be built up to both ends; thus it is customary procedure to build up one end by the metal spraying operation and then reverse the work. This method, however, has several disadvantages. First, concentrating on one end may result in overheating unless time is allowed for cooling. Second, it is poor practice to clamp a dog or chuck jaw on a prepared surface unless the surface is protected by wrapping with suitable material. Third, reversing the work requires extra time and care must be taken in handling to keep the prepared surface clean.

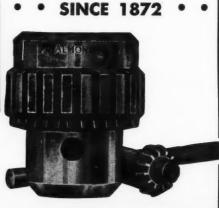
To eliminate these difficulties in the shop of the Capital Transit Company, Washington, D. C., the company engineers designed the spring-backed centers shown in Fig. 1. Although



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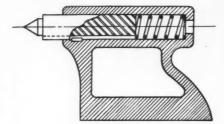
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springs are provided behind both centers, the spring which backs up the tailstock center, indicated at A, is



The spring-backed tailstock center illustrated here in cross section serves admirably to eliminate difficulties caused by expansion of work under heating of metallizing.

somewhat longer and stronger than the spring behind the headstock in the Assembly B.

When the tailstock ram is advanced and the tailstock center then gauges

the center hole in the work, the spindle center C is pushed in far enough to allow the hardened steel pins D to engage the end of the shaft. The sizes of the centers and springs are determined by the size and type of work to be handled.

Another design of spring - backed tailstock center is shown in Figure 2. In this design the hand-wheel and screw are removed and the spring is inserted back of the ram. The spring provides the necessary "give" so that the center can recede as the work expands from the heat of the metallizing gun. The only adjustment is the location of the tailstock at the correct position on the ways, but since the spring provides ample adjustment, this is not too difficult. A ball-bearing center may also be used in this design, which will eliminate the necessity of watching to see that the center is properly lubricated.

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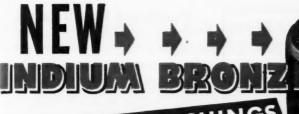


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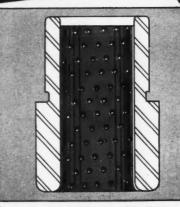
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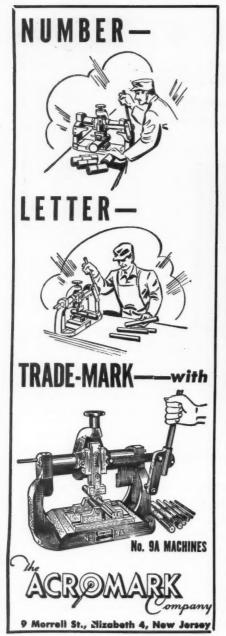
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### Shipboard Repair Saves \$50,000

(Courtesy General Electric Company)

BY machining the badly scored journals of the Mormacwave's main propulsion 22-ton bull gear on shipboard, General Electric's New York Field Engineer and Service Shop, co-

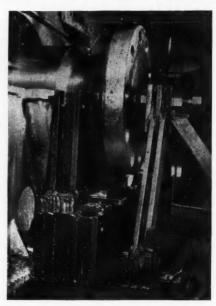


Fig. 1—Special jig, fabricated of two-inch welded steel plates, used to support 10-foot bull gear shaft and hold it rigid during machining.

operating with Todd Shipyard, saved the operator—the Moore-McCormack Lines—an estimated \$50,000 and enabled the ship to sail ahead of estimated schedule.

Drydocked for major repairs, space limitations in the engine room and weight of the bull gear indicated that the unit would have to be removed from the ship for machining. However, hoisting the gear from the engine room would have necessitated the re-

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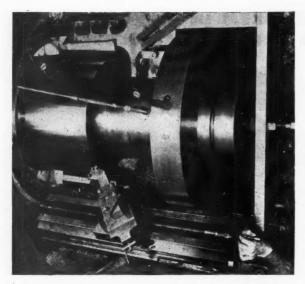


Fig. 2—Close-up of buil gear journal in special jig, showing cutting tools, two-dial gages, lubricating line, and chip guards.

moval of extensive piping, ladders, gratings, and sundry machinery.

Deciding that shipboard repair was most practical, General Electric's Field Engineer and Service Shop designed a special jig to hold the 14-foot bull gear and shaft in position for machining the journals. Two sections of the line shaft were moved back to provide room at the end of the bull gear. To support the gear and hold it rigid, a special jig was fabricated of two-inch welded steel plates. A large electric motor supplied power to turn the gear at machining speed.

The design and construction of the supporting jig required two weeks. Two shifts, working round the clock, completed the machining operations in one week. Machining was so accurate that the position of the shaft in reference to the pitch line of the gear was unchanged and a zero

tolerance maintained.

The shipboard machining operation permitted other repairs to be done simultaneously which eliminated the necessity of completing hull repairs and then floating the ship for removal of the bull gear.

The service shop also rebucketed two rows on the 8500-hp low-pressure main propulsion turbine rotor in place, saving the expense of removal from the ship. Ashore, a new row of buckets was installed in the second-stage wheel of a new 250-kw turbine rotor in addition to rebabbiting and rema-

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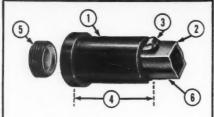
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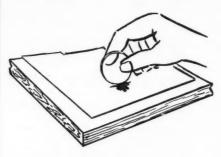
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chining the turbine and small gear bearings. Four new bearings for the bull journals were built by the Company's Lynn River Works.

### **Eye-Glass Makes Good** Eraser

By A. H. WAYCHOFF

T last a good use has been found A for discarded eye-glass lenses. If the lens has a sharp edge, it will be found very handy for removing ink



An eye-glass lens or watch crystal makes an excellent tool for erasing ink from drawings.

blots or making other erasures on inked drawings; in fact, it is much better than sandpaper, the pocket knife or other commonly used tools.

The lens is held at right angles to the drawing as shown in the illustration and the spot is lightly scraped with the edge of the lens.

Due to its shape, the lens is prevented from digging in and thus avoids tearing or pulling the fibre in the paper or cloth. The draftsman will quickly learn how to hold the lens at the correct angle so as to remove the ink lines or spots without damaging the tracing cloth or paper. A watch crystal will serve equally well for this purpose.

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## News of the Industry

### ASM Annual Meeting and National Metal Exposition

A seminar on "Fundamental Relations In the Fracturing of Metals," sponsored by the American Society for Metals and co-ordinated by the Case Institute of Technology, Cleveland, will be held as a special two day technical program of the ASM Annual Meeting to be held at the Palmer House in Chicago on Saturday and Sunday, October 18th and 19th, as a part of the 29th Annual National Metal Congress and Exposition.

According to an announcement made by W. H. Eisenman, national ASM secretary, the seminar will be conducted during morning, afternoon and evening

periods on both days.

"The ASM," said Mr. Eisenman, "is fortunate in having assistance of Case Institute of Technology in arranging this program. The seminar should be exceedingly valuable in contributing to the genral fundamental knowledge on the subject. It is our feeling that such a first hand exchange and discussion of views is the most efficient method of gaining a better understanding of the fundamental factors on this particularly complex subject.

"The speakers will not present papers as such, but rather will give talks on fundamentals, based upon the large amounts of research and analysis in which each has actively engaged. Subject matter has been split up and each phase has been assigned a speaker who is an authority in that particular field. The first choice of the speakers was made from those persons who have been concerned recently with the evaluation of results obtained in this field, rather than from those who have done particularly interesting experimental work in the field. In many cases, however, the speakers are also among the outstanding experimenters. This method of presentation should afford a complete and authoritative coverage of the overall relations."

Five sessions have been outlined, covering the fundamental relations involved in the fracture of metals, the fundamental factors and discussions of methods

for determining and evaluating fundamental relations and factors.

On Saturday evening at 6 o'clock a dinner will be held in honor of Dr. P. W. Bridgman of Harvard University, 1947 winner of the Nobel Physics Prize. The Harvard professor will also speak at the Sunday morning meeting.

Chairmen of the five meetings include Dr. George Sachs, Case Institute of Technology, Cleveland; Dr. L. N. Donnell, Illinois Institute of Technology, Chicago; Dr. Cyril S. Smith, University of Chicago, Chicago; D. F. Windenburg, David Taylor Model Basin, Washington, D. C.; Dr. Finn Jonassen, National Research Council, Washington, D. C.; Dr. J. H. Holloman, General Electric Company, Schenectady, N. Y.; Dr. L. E. Grinter, Illinois Institute of Technology, Chicago; Dr. Maxwell Gensamer, Pennsylvania State College, State College, Penna.; Dr. W. P. Roop, Swarthmore College, Swarthmore, Penna.; and Dr. J. E. Dorn, University of California, Berkeley, Calif.

Prominent speakers who will appear at the various meetings include Dr. Gensamer, Dr. Clarence Zener, University of Chicago; Dr. Dorn; Drs. Sachs and Hollomon; I. G. Slater, British Admiralty Delegation, Washington, D. C.; E. R. Parker, University of California, Dr. Roop; P. Shearin, University of North Carolina, Chapel Hill, N. C.; P. Symonds, Naval Research Laboratory, Washington, D. C.; Dr. Bridgman; J. Marin, Pennsylvania State College, State College, Penna.; J. D. Lubahn, General Electric Company, Schenectady, N. Y.; E. Saibel, Carnegie Institute of Technology, Pittsburgh, Penna.; E. S. Machlin, National Advisory Committee for Aeronautics, Washington, D. C.; and Dr. George Irwin, Naval Research Laboratory, Washington, D. C.

Slightly more than 90% of the 240,000 square feet of available floor space in Chicago's International Amphitheatre has been reserved for the National Metal Exposition, October 18th to 24th.

The National Metals Exposition, sponsored by the American Society for Metals, will be held concurrently with the National Metals Congress. In addition to the



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ASM, technical meetings during the week will be held by the American Industrial Radium and X-Ray Society, the American Welding Society, the Iron and Steel Division and the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers.

#### 68th Annual Meeting of ASME

Secretary of State George C. Marshall has been elected to honorary membership in The American Society of Mechanical Engineers, according to an announcement by Clarence E. Davies, Secretary of the society. In a letter to Eugene W. O'Brien, of Atlanta, Ga., President of the engineering society, Secretary Marshall formally accepted the honor and said that if his other commitments allow, he will attend the annual dinner, to be given on the evening of December 3 in Atlantic City, to accept the award in person.

Henry Ford II, President of the Ford Motor Co., Detroit, will be the speaker at the dinner. His subject has tentatively been announced as: "Greater Production for Peace." the dinner will feature the 68th Annual Meeting of the Society, December 1-5, 1947, in Atlantic City, the first

one to be held outside of New York.

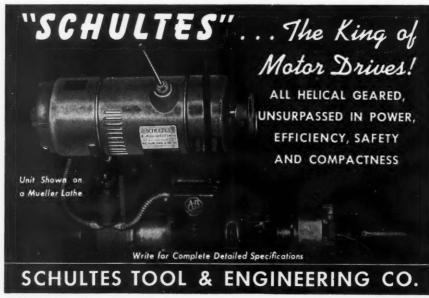
Others who have been named to receive honorary memberships at that time are: Dr. Harry N. Davis, President of Stevens Institute of Technology, a Past President of the ASME, formerly director of the office of production research and development of the War Production Board; Francis Hodgkinson of New York, retired consulting engineer, who was connected with the Westinghouse Electric Corp. from 1896 until 1936, a former Vice President of the ASME and its Holley Medalist in 1938, and Everett G. Ackart of Wilmington, Del., retired, formerly chief engineer of E. I. du Pont de Nemours and Co., Wilmington. Lord Dudley Gordon, President of the British Institution of Mechanical Engineers, and noted English authority on refrigeration, received a similar honor earlier this year, in London.

Medals and Prizes for 1947, to be conferred at the Annual Meeting, have been

announced as follows:

The ASME Medal, highest honor of the engineering socity, to Paul W. Kiefer of New York, chief engineer, motive power and rolling stock, New York Central Railroad.

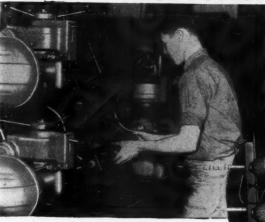
Holley Medal to Raymond D. Johnson,



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"We have been amazed at the economies obtained by incorporating standard Walker-Turner 20" Power Feed Drill Heads in a special set-up which we designed," says Mr. A. G. Stahl of the Engineering Department of the Tube Manifold Corporation, Buffalo, N. Y.

"In drilling double end tube closures, eight operations were consolidated into one. With a single operator, production has been increased 700%.

"We prefer Walker-Turner Drill Presses because of the added advantages of the ten spline spindle with no play, the six inch spindle travel and wide speed ranges. The low initial cost of these machines and their adaptability for special set-ups have solved many of our production cost problems."

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D1100X-20" Power Feed Drill Head Unit. Five standard spindle speeds, 400 to 2600 r.p.m. with 1740 r.p.m. motor. Price, less motor . . . . . . . . . \$216.00

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You will eliminate from your payroll, many hours of highly-paid Machinists' time if you have these men use the JACKSON TIME-SAVING VISE. It cuts out the time they are forced to waste hunting for Bolts, Clamps, Angle Plates, Parallel Strips, etc., when "rigging up" work on the Drill Press, Miller, etc. Furthermore, you can eliminate the simultaneous loss of output and overhead expense incidental to having your productive machine idle during the "rigging up" process. The four-side turret jaw and supplementary jaws enable the Vise to hold quickly, THE THOUSAND AND ONE SHAPES that arise annually in Machine Shop work. SEND FOR BULLETIN No. 23-M.



## BROWN ENGINEERING CO.

120 N. THIRD ST. READING, PA.

hydraulic engineer, retired, Fort Lauderdale, Fla.

Worcester Reed Warner Medal to Arpad L. Nadai, consulting engineer, Westinghouse Research Laboratories, East Pittsburgh, Pa.

Melville Prize Medal to Raymond C. Martinelli of the general engineering and construction laboratory, General Electric Co., Schenectady, for an original paper on "Heat Transfer to Molten Metals."

#### S. E. S. A. Annual Meeting

The Annual Meeting of the Society for Experimental Stress Analysis will be held at The Hotel Pennsylvania, New York, N. Y., on December 4, 5, 6, 1947.

Inquiries should be addressed to the Society for Experimental Stress Analysis, P. O Box 168, Cambridge 39, Mass.

#### Tool and Die Manufacturers will Meet

The 1947 Annual Meeting of the National Tool and Die Manufacturers Association will be held November 2-5 at The Benjamin Franklin Hotel, Philadelphia, Pennsylvania.

Arrangements are in the hands of George S. Eaton, Executive Secretary of the Association, Cleveland, and Adolph E. Berdick, Engineering Tool Company, Philadelphia, who is chairman of the Convention Committee. Willis G. Ehrhardt, Ehrhardt Tool and Machine Co., St. Louis, is President of the NTDMA. General membership sessions will be held on Monday and Tuesday, November 3 and 4, with sight-seeing trips on the 5th. Committees and the Board of Directors will meet on the 2nd.

#### Canadian Plant Serves American Manufacturers

A general machine shop, designed for the production of mechanical parts and units in the lighter class such as pumps, transmissions, and so on, has been opened by Linton Engineering & Machine Co., 123 Church St., Sault Ste. Marie, Ontario. S. J. Linton is manager. The plant is set up expressly to serve American manufacturers who wish to have their products made in Canada for the Canadian market and all such manufacturers are invited to communicate with Mr. Linton.

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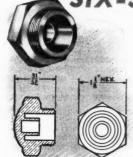
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GREENLEE

## SIX-SPINDLE AUTOMATICS



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BRASS BACK-CAP FOR HIGH PRESSURE GAS REGULATOR

This piece has an internal tubular protrusion (the valve seat and valve stem spring guide) which is produced by a trepanning operation. Other forming, threading, and cut-off operations are conventional. Former machining time on the piece on single-spindle machines was 5 times greater than is now required on the Greenlee Automatic.

Here's another example of substantial savings made possible in . manufacturing costs through the application of Greenlee Multiple-Spindle Screw Machines. At Bastian-Blessing Company of Chicago, production of brass parts has been stepped up as much as five times over previous output when single-spindle machines were employed exclusively. In addition, only a fraction of the floor space is required. Economical tooling and quick change-over features of the Greenlee are added advantages that contribute materially to production efficiency. For example, no cams are required to operate the main tool slide. Precision stroke adjustments can be made in less than five minutes.

ice cream equipment, and other products.



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timesaving and cost-saving features of Greenlee Automatics. Ask to see the new 40-minute sound movie showing the basis of the saving t



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MULTIPLE SPINDLE DRILLING, BORING, TAPPING MACHINES . AUTOMATIC SCREW MACHINES . AUTOMATIC TRANSFER PROCESSING MACHINES



Every Forsberg Blade bears the famous WHALE BRAND mark of quality. Scientific heat treating and thorough check every step of the way, plus a severe bending pounds test gives Forsberg Blades superior performance. The popular HY-FLEX Blade meets today's demand for extreme flexibility at medium price—it has the guts for solid service.



A Whale of a Blade—MO-HY'S special molybdenum steel gives unusual cutting service—some speed as tungsten with comparable performance. For outstanding results on stubborn jobs, ask yeur mill supply house for WHALE BRAND HY-FLEX and MO-HY SLADES.



#### Jarvis Acquires Dowding Div. of Henry L. Hanson Co.

The acquisition of the Dowding Division of the Henry L. Hanson Company, North Attleboro, Massachusetts, by The Charles L. Jarvis Company, Middletown, Connecticut is announced by Marshall N.

Jarvis, president.

The Dowding Division has devoted all its facilities to the manufacture of taps and dies for the industrial trade, primarily in the New England area. It is the intention of the new owners to broaden this distribution and make Dowding taps and dies available on a national basis. Distribution will be handled through the established representatives of The Jarvis Company.

The Dowding plant will remain at North Attleboro. Sales of the new division, which will be known as the Dowding Division of The Charles L. Jarvis Company, will be directed from The Jarvis Company headquarters at Middletown,

Connecticut.

Carborundum Buys Philco Chicago Plant

Vice President and General Sales Manager, Mr. F. J. Tone, Jr., announces the purchase by The Carborundum Company, Niagara Falls, N. Y., of the former assembly plant of Philco Corporation at 3345 West 47th Street in the Central Manufacturing District at Chicago, Ill. The acquired building, after additions and alterations, will become the Chicago sales offices and warehouse of The Carborundum Company and will be under the direction of Mr. C. E. Hawke, Domestic Sales Manager, Mr. W. C. McCargo, Regional Sales Manager, with Mr. Gordon C. Watson in charge as District Sales Manager.

The new warehouse is to carry complete stocks of grinding wheels, coated abrasives, abrasive grain, sharpening stones, rubbing brick, and other abrasive products, as well as a stock of refractories by Carborundum, for servicing industries in the Chicago area proper and surround-

n the Chicago area proper and surround-Included in the facilities of this thor-

ing territories.
oughly modern sales office and warehouse
will be complete service equipment for
the refinishing of grinding wheels and
a grinding laboratory for the practical
demonstration of coated abrasives. The
grinding wheel finishing shop will be placed at the service of local industries for
cutting down wheels, for rebushing of
wheels, for recessing and beveling.

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• Williams "Superior" Wrenches are drop-forged from a selected grade of carbon steel and processed to exacting specifications. They are substantially twice as strong as the earlier carbon steel wrenches of our own manufacture. Comparative tests show that these wrenches average 93% as strong as our corresponding alloy steel wrenches costing approximately twice as much.

Most industrial users find Williams "Superior" Wrenches their logical choice considering both strength and economy. "Superior" Wrenches are made in 50 patterns . . . more than 1,000 sizes, and are sold by Industrial Distributors everywhere.

J. H. WILLIAMS & CO., BUFFALO 7, N. Y.



## Semi-Annual Convention of American Society of Tool Engineers

to be held at Boston Oct. 30-31 and Nov. 1

PRESIDENT W. B. Peirce of the American Society of Tool Engineers has announced that the semi-annual convention of that society will be held at Boston, Massachusetts, October 30 and 31 and November 1, 1947. Convention head-quarters will be the Hotel Statler, where the entire mezzanine floor will be turned over to the expected 3500 guests from all parts of the United States and Canada.

The technical sessions will be headed up by authorities in the several fields upon which the discussions are to be centered. The first session, to be held Thursday afternoon, October 30, will be devoted to the subject "A New Concept in the Field of Abrasives; 32 Alundum." The chairman will be G. A. Rogers and three representatives of the Norton Company, Worcester, Mass., will appear on this program; W. T. Montague, vice president and manager of business planning and development, A. A. Klein, assistant director of research, and G. T. Rideout, sales manager.

In the Thursday evening session H. E. Linsley of the "Iron Age" will officiate as chairman and E. Giradot, foreman of the tool design section of General Electric's Schenectady plant will talk on "Welding as Applied to the Construction of Tools, Dies, Jigs and Fixtures." D. W. Puffer of the welding section, General Electric River Works, Lynn, Massachusetts, will also appear on this important

program.

"Material Handling" will be the topic for the Friday afternoon session, with E. W. Baumgartner, of Cleveland, Ohio, as the chairman. Edward W. Burnell, vice president, Link-Belt Company, will open the session with an address on "Economics of Good Material-Handling Equipment." C. A. Litzler, president, Industrial Ovens, Inc., will talk on "Material Handling Through Heat Processes and Monofilament Material Handling" and Thomas N. Parlon, associate director of field activities of Yale & Towne Manufacturing Co., will discuss "Production

is Material on the Move."

Friday evening, October 31st, A. A. Nichols will lead a session on "Bearing Applications." Ted Miller, vice president and general manager of the Fellows Gear Shaper Company, will give the keynote talk. Papers on "Bearing Selection" and "Plain Bearings" will be presented by F. E. Ericson, vice president, Barden Corporation, and Lewis Sandler, executive vice president, Johnson Bronze Company.

Otto W. Winter, chairman of the A.S. T.E. committee on Education, will occupy the chair at the Saturday morning session, which will be devoted to "Professional Development of the Tool Engineer." Dr. Mark Ellingson will appear on this program and Dr. William T. Alexander, Dean of Engineering at Northwestern University, will speak on "The Tool Engineer and America's Future Defense."

The subject of the final technical session, Saturday afternoon, will be "Tooling for Watches and Clocks," with James O. Horne as chairman and Walter E. Mutz, treasurer, Chelsea Clock Company as the keynoter. "Tooling for Electric Clocks" will be described by Harry B. Whitehead, general superintendent, Telechron, Inc.; "Tooling for a Fine Watch" will be discussed by E. W. Drescher, superintendent of product engineering, Hamilton Watch Company, and "Mass Production of Watches and Clocks" will be the subject of a talk by Roger M. Tarpy, managing director, Vulcan New England Company.

Morning programs will consist largely of tours to the plants in the Boston area and of "how-to-do-it" movies. Saturday morning. Nov. 1, the engineering laboratories of Massachusetts Institute of Technology will be open to ASTE visitors.

The highlight and closing feature of the convention will be the national banquet, to be held Saturday evening, Nov. 1, in the ballroom of the Hotel Statler. One of America's leading industrialists will be the guest speaker.

## SANFORE SURFACE GRINDERS

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Handles many odd size tool room and production jobs, due to its capacity of 8" x 12" x 12". Actual movements — Transverse 83/4" — Longitudina 13" — Vertical 12" (under 7" neel).



## BENCH SURFACE GRINDER

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A sensitive, highly accurate machine specially designed "for the job the fits in your palm."

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MODERN MACHINE SHOP

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## Guest Editorial

### It Has Happened There

By George S. Benson President, Harding College

MOST of us thought it would never happen. But it has. According to the Associated Press, the House of Commons on August 8 approved a bill giving the British government authority to tell its people where they must work and what they must do. This means that the government may order men and women to do whatever job it pleases: coal mining, farming, fishing, anything. Moreover, it means the government may choose the place where any man or woman must work.

This is a drastic step. Why is individual freedom thus destroyed by a country with such a long record of high devotion to the individual citizen and to freedom? The answer is simple. Two years ago a socialistic government embarked upon a campaign for government management of leading industries in England. Things were in such a bad way, because of weakness from war, that the people permitted this.

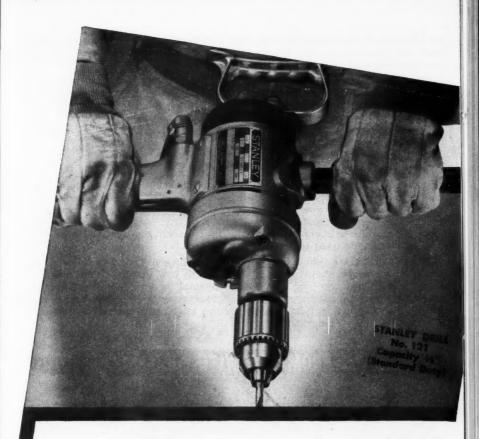
#### **Crises Upon Crises**

The socialistic government relied upon nationwide sympathy and cooperation. However, this lasted only a few weeks. Then, as absenteeism set in and productivity lagged, the whole system bogged down. The crisis came last winter, when a terrible coal famine came to that country with plenty of coal under ground. Under socialism, crisis thrives on crisis, and there were more to come. In these crises, it is easy for men to accept disaster, if they think it will prevent more disaster.

This is what has happened. In an apparent but final resort to keep government management of industry from becoming a complete failure, the British are taking this drastic step. Yes, in peace-time one of the greatest liberty loving countries in the history of the world has given its government authority to draft labor, and to tell each man and woman where to work and what to do.

#### Our Forewarning

That England takes this most fatal step means forewarning aplenty to the American people. The heritage of modern Britain is also our own heritage. Our common forefathers loved freedom. Because England enjoyed the great-



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Precify [STANLEY] the greatest name in tools

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est measure of freedom compared with any large country in Europe, she became an influential power. English influence has done much to make men free the world around.

But despite their great love of liberty, the British people have now found that loss of individual freedom follows adoption of a government managed economy, just as night follows day. It leads to this every time. It is sad to see this great country, like others that have accepted the blandishments of socialism, willingly give up the freedoms for which her people have shed blood through the centuries.

#### Let's Have Freedom

A considerable number of our people are evidently inspired by foreign ideologies, and some are asking for government control of American industry. This step England is now taking is a real warning to all American workers that with government management of industry there must surely come government dictation to workers. The workers, in the face of constant crisis, are told where to work and what to do.

Seeing that these things point in every direction toward a totalitarian government, our people should make up their minds now that we do not want government managed economy. What is happening in liberty loving England is proof that such dictation cannot be avoided once government management is adopted. Let us determine now that such a blight shall not fall upon the freedom loving land of America.



Send us your old drills—we'll make them new again at a fraction of the cost of a new drill! Exclusive NU-TANG\* process replaces twisted or broken tangs with brand new tangs of correct size—and with GUARANTEED ORIGINAL STRENGTH. No welding—No distortion—No shortening of drills—No sleeves.

Any drill, reamer, or other tool with a Morse taper in sizes 2 to 6 can be repaired perfectly this quick new way. Delivery—One week. Used by many leading industrial plants. Amazingly low cost—satisfaction guaranteed! Send for complete information.

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1,000's Saw For Themselves How Easy and Simple It Is To Radially Relieve Tools For Better Finish, Cooler and Faster Cutting.

With D-S you can radially relieve to a clean cutting edge almost any form that can be dressed in the wheel. Leave margin if you wish, parallel with the flute—convert twist drills into special step cutters, etc. Any good grinder hand can do this work faster than plain angular back off.

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THE NEW WAY



ROYAL OAK TOOL AND MACHINE CO.

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Step Drills Taps

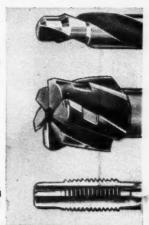
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All types of dusts are stopped by Dustkops:
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## L-W

ANNOUNCING THE NEW

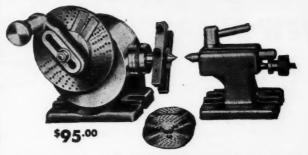
L-W Model SD 61/2" UNIVERSAL

DIVIDING HEAD

Well built for hard daily usage on smaller millling machines. Rugged head and tailstock.

Alloy steel spindle has a tapered bearing. Bored for No. 9 B & S taper threaded spindle nose. Head tilts to 90°+ in vertical position. Special alloy steel worm and bronze worm wheel cut to close limits for accuracy. End thrust is taken out by bronze headings.

bronze bearings.
Complete with three index
plates for dividing all numbers to 50, and even numbers
to 100, with the exception of
96T. Index chart shows all
divisions obtainable to 380.



## L. W. 11" UNIVERSAL DIVIDING HEADS

Headstock — Rugged. Rigid. Swivels to any angle.
Tailstock — Sturdy. Withstands heavy cutting.
Headstock Spindle—Tapered bearings, bored for No. 10 B

Headstock Spindle—Tapered bearings, bored for No. 10 B & S Taper. Increased diameter and length. Threaded spindle nose, 2¼" diameter 10 thread USS.

Worm — Special alloy steel, accurately finished, ball bearing end thrust. Easy, accurate, adjustment of worm wheel. Large diameters worm wheel bare diameters worm wheel bare diameters with the steel of the steel and the steel of the steel

Worm Wheel—Large diameter, 40: I ratio, accurately generated, securely mounted on spindle.

Equipment — %" table slot tongues, three index plates, dividing all numbers to 50, and even numbers to 100, with the exception of 96T.

Index chart shows all divisions obtainable to 380. When ordering AU Heads specify either right or left hand model.

Fully
Universal
for Complete
Indexing and
Spiral Cutting
\$219.15

**Model AU** 

\$219.15 Model BP for PLAIN MILLING MACHINES \$151.20



Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



L-W CHUCK COMPANY 28 SO. ST. CLAIR ST. TOLEDO 4, OHIO



#### Coulter Die Threading Machine

A machine for thread milling straight and tapered threading dies is announced by the James Coulter Machine Co., Dept. R, Bridgeport 5, Conn. A wide range of speeds and feeds is said to be possible due to the fact that the work spindle and the cutter spindle are driven by individual motors. With this method of drive, the variation in speeds and feeds required for both carbon steel and high speed steel is obtainable.

An infinite range of speeds from 100 to 650 r.p.m. can be obtained on the cutter spindle, thereby maintaining the proper

cutter speed when using small diameter milling cutters in milling small diameter dies. With the standard change gears furnished for the work spindle drive, machine cycles from 26 to 155 seconds are obtainable to handle the range of die sizes within the capacity of the machine.

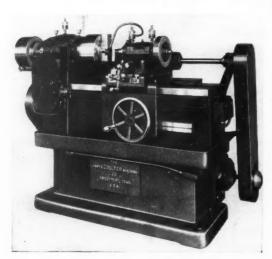
With the use of a relieving attachment, dies having any number of cutting edges can be produced in one revolution of the work. Eccentric and concentric reliefs are said to be produced on each land, and all lands are claimed to be identical in every respect since one revolution of the relieving cam produces only one land. The

number of lands to be thread milled and relieved is controlled by simple pick-off gears in the f

a

gear train.

Round, square, or any other shaped dies can be held for the thread milling operation either by an air-operated work-holding fixture or by other types of work-holding fixtures to suit the character of the die to be thread milled. The machine has sufficient capacity for thread milling pipe dies from %-inch pipe size up to and including 2-inch pipe size. The straight model machine for straight dies has sufficient capacity for dies from the %-inch standard size up to and including the 2-inch standard size.



Coulter Die Threading Machine



The STARRETT reputation for quality and accuracy also applies to hacksaws and band saws. Saws made by the "World's Greatest Toolmakers" can be counted upon to equal or exceed the performance of other brands, saw for saw and job for job. And the STARRETT line is truly complete—including hacksaws in all sizes and types for hand and power metal cutting and band saws for cutting ferrous and nonferrous metal, wood, plastics, fibre and other materials . . . for all standard band saw machines.

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Send for Starrett Hacksaw and Band Saw Booklet MD and Starrett Cuting Chart. They'll help you cut better, faster and at lower cost.

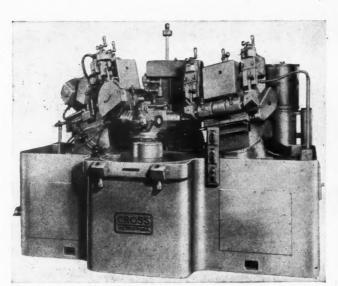


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HACKSAWS • BAND SAWS FOR CUTTING METAL, WOOD, PLASTICS



Cross Special Grinding and Chamfering Machine

## Cross Special Grinding and Chamfering Machine

A special machine tool for grinding teeth in spring clutches from the solid and simultaneously chamfering one side of each clutch has been developed by The Cross Co., Detroit, Mich. According to the manufacturer, a production of 200 eight-tooth clutches net per hour can be obtained with the machine by one operator.

A three-station turret power indexes the workpieces from station to station; the first station is for loading and unloading, the second station for grinding the teeth, and the third for chamfering. In addition to the indexing of the turret, the parts automatically index on their own

axis at each station from one tooth to the next. When the work stops rotating, thus providing for quick and easy loading and unloading. The grinding wheels are automatically dressed while the turret indexes; size is maintained by automatically compensating for the amount dressed from the wheel.

The machine is completely univer-

cal within its range, with provision for various numbers of teeth, as well as for a variety of tooth sizes and angles.

### Microhoning Equipment

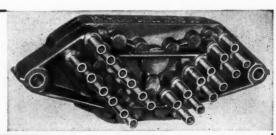
The Micromatic Hone Corp., School-craft, Greenlawn & Martz, Detroit 4, Mich., has announced a new line of Microhoning machines and tools. This equipment, the Microhoner machine and Micromold Utility Tools, is desgined for general toolroom use, semi-production, and salvage or reconditioning work.

The Microhoner Model No. 717 illustrated herewith is an all-mechanical machine. The stroke, reciprocation, and rotation speed and head to table distance

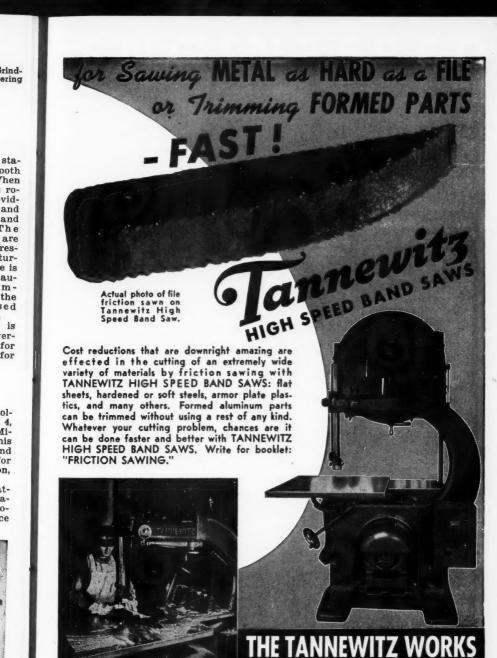
Pictured: a 24-Spindle Heavy-Duty Drill Head.

DESIGNERS AND MANUFACTURERS OF MULTIPLE DRILL-ING EQUIPMENT.

We Invite Your Inquiry.



MICHIGAN DRILL HEAD CO. 971 E. 8-Mile Road, Hazel Park, Mich.

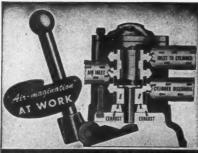


October, 1947

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## Lehigh-MARTON PISTON TYPE 4-WAY VALVE

## "Air-magination" SAVES SPACE • TIME • MONEY

Diagram above shows simple, rugged design of new Lehigh-MARTON Piston-Type Air Valves. Easy to install. Simple to maintain. Adaptable to all compressed air uses. %" or ½" supply connections. Foot or hand control. Automatic or manual. With or without the MARTON Combination Regulator, Gauge, Lubricator and Strainer • Write for catalog of the complete Lehigh-MARTON line. Marton Air-Valve Division.

LEHIGH FOUNDRIES, Inc., EASTON, PA.

Mew England Rep. MARTON EQUIP. CO.

145 Cabot St., Beverly, Mass.



Lehigh-MARTON AIR-CONTROL EQUIPMENT

are all adjustable so that the one machine may be used to Microhone a range of bore diameters from  $\frac{1}{2}$  to 4 inches.

The controls are simple. The tool expansion is controlled by rotating an adjusting sleeve. This sleeve is on the spindle, but does not rotate with it. The operator may expand or collapse the tool, at any time, at a controlled rate. A liftout stroke of  $3\frac{1}{2}$  inches is provided in addition to the 6-inch working stroke.



Microhoner Model No. 717

The head is counterbalanced, and the starters for the rotation and reciprocation motors are interlocked with the lift-out arm. The operator has only to shift the lift-out arm to stop, start, or "inch" the spindle rotation and reciprocation.

The Micromold Utility Tools are designed to cover a wide range of types and sizes of bores. Five tools are said to cover a range of bore diameters from 1 to 4 inches. The Micromold sticks used in these tools have the abrasives encased in plastic stone holders. When the abrasive is used up, the entire Micromold abrasive unit is discarded and a new set of sticks

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Standard shanks with Mors tapers carried in stock send us your specification and blueprints we will see that your job is set u with the right LIVE CENTER

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LARGE THRUST BEARING

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GROUND TRUE with BEARINGS— REPLACEABLE ALLOY STEEL POINT.

# STURDIMATIC

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is inserted. The plastic case about the abrasive also controls the breakdown of the abrasive so that an efficient cutting action is obtained.

According to the manufacturer, the Microhoning equipment affords an economical method of removing stock from cylindrical surfaces and at the same time correcting taper, out-of-roundness, or other geometric inaccuracies caused by

## Hobart A.C. Industrial Arc

wear or previous operations on the bore.

An unusually large illuminated current indicating scale is the principal feature of an industrial type a.c. transformer welder announced by The Hobart Bros. Co., Box 13, Troy, Ohio. The scale is uniformly calibrated so that the extra large figures are evenly spaced from maximum to maximum welding heat settings. The dial is of translucent plastic, illuminated from within by a 110-volt lamp mounted in a standard base, thus making it very easy to read from a distance in either light or dark locations. This light also acts as a telltale, indicating that the transformer is energized.

The welder is of the moving coil type (both primary and secondary coils move when adjustment is made) with no adjustable magnetic paths. Since one coil always moves upward, the weight of the descending coil helps lift the ascending coil, thus compensating for the effect of gravity and making the welding heat adjuster easy to turn. Adjustment of current is made by means of a convenient knob on a pressed steel disc that serves as the drip-proof top cover of the case.

According to the manufacturer, the welder has an unusually high full load efficiency and an unusually low no load input. All coils are made of glass-covered copper strap and all insulation is Class B. The circuit reactance and the no load voltage are so balanced as to make arc starting prompt and easy for any thickness of metal, without requiring special relays for this purpose. A capacitor is built in the unit for power factor correction.

All connections are enclosed in the case; power supply cables pass through a knockout in the rear of the case to a three-stud panel, which is accessible through a door that remains closed when the set is in use. Welding cables pass through two holes in the front of the case

# WILLEY'S "606" UNIVERSAL CUTTING GRADE

This new, Universal grade of Willey's Metal is now ready to serve you. It will machine every type of steel—and in many plants is increasing production as much as 3 to 1 over other grades.

It is available in standard tools, specials and blanks. It can be used at low speeds with heavy feeds as well as for light finishing cuts.

It is truly a universal grade that lends itself to ALL turning applications.

Write for Full Information

### WILLEY'S CARBIDE TOOL CO.

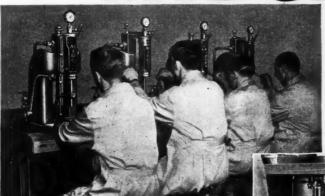
SOLE MAKERS OF BILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

## **Produce Your Successive-Operation Jobs Faster** with the

## MULTIPRESS XGRIT



All four of these Multipress Midgets are being operated by ONE pumpunit, shown below. Up to 12 Midgets may be used with one such unit-the ultimate in low initial and operation cost!

SPECIFICATIONS (basic unit)

. Capacity (ram effort), 1 ton . Stroke, 6" • Ram speed adjustable up to 400 ipm down-600 ipm up . Daylight, 10" to 14" • Throat depth, 5" • Base Plate tooling area (optional), 10" x 10" (standard) • Dimensions, 243/4" high x 17" deep x 181/4" wide • Weight without base plate,

130 lbs.

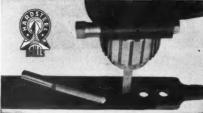
When your manufacturing calls for successive operations on a part, multiple or "gang" installations of the Multipress Midget will give you increased production -with low initial cost! Up to 12 units may be used with a single, centralized power source, with each Midget having individual pressure adjustments. Pressure range is 200 to 2000 lbs.

All the production features of the famous Multipress are incorporated in the new Midget. Its Oil-smooth HydrOILic power offers you Vibratory repeat strokes, fast approach and slow pressing speeds, either dual hand lever or foot pedal safety controls-plus adjustable stroke length, ram speed and pressing effort. Write today for Bulletin M-15.

THE DENISON ENGINEERING COMPANY 1153 Dublin Road. Columbus 16, Ohio



## **Drill Hardened Steels without** Annealing with "HARDSTEEL"



Don't let anyone tell you that hardened steels must be annealed before drilling, countersinking, counterboring or reaming.

With "HARDSTEEL" drills you can produce accurate, smooth holes in steels hardened by any process-oilhardened, water hardened, cyanided, nitrided, and they work equally well on work-hardening steels and high carbon-high chrome steels of any degree of hardness.

"HARDSTEEL" drills used with standard drill presses cut costs in production shops because parts drilled after hardening always match at assembly. In service shops they save time and material and permit engineering changes calling for additional drilling to be made after parts are full hardened.

Write for a copy of the "HARD-STEEL" Operators Manual showing how "HARDSTEEL" drills are now functioning in thousands of plants in parts recovery operations.

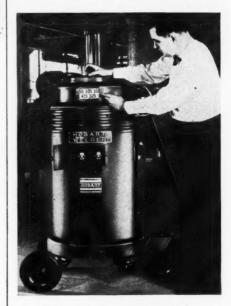
You Harden It - We'll Drill It with "HARDSTEEL"

"HARDSTEEL" Tool bits make faster, deeper cuts on steels and non-ferrous alloys.

**BLACK DRILL CO., Division Black Industries** 1390 East 222nd Street + Cleveland 17, Ohio

HARDSTEE DRILLS . TOOL BITS . SPECIALS to a two-stud panel, which is lighted by the lamp from above and which is also accessible through a door that remains closed while the set is in use. No electrical connections are provided between the power lines and the welding cables. A heavy layer of mica between primary and secondary coils is said to prevent the possibility of line voltage carrying across to the welding circuit.

The case is of 16 gauge steel, rolled and welded with circumferential louvres at the top that are drip-proof. A powerful fan at the bottom of the case draws



Hobart A.C. Industrial Arc Welder

fresh, cool air through the drip-proof louvres at the top and expells it at the bottom of the case.

To provide space between the floor and welder, four steel feet are bolted to the frame. A three-wheeled steel truck, as illustrated, may be bolted to the feet if desired. Both stationary and portable types are said to be easily handled with a crane or hoist by means of the two lifting eyes on the top of the case.

The welder is offered in 300 and 500ampere sizes for operation on singlephase, 60-cycle current, either 220/440 volts or 550 volts. It can also be furnished

for 50 cycles if desired.



And here is an additional saving that makes their longrun cost comparatively insignificant: Nicholson CC Burs can be resharpened and resharpened—so long as a workable circumference remains. Nicholson offers you this resharpening service at very reasonable cost and with precision standards fully as high as maintained in the original manufacture.

NICHOLSON FILE CO., 93 Acorn St., Providence 1, R. I.
(In Canada, Port Hope, Ont.)

Nicholson CC Burs cut all types of ferrous and non-ferrous metals. Nine standard shapes; 3 degrees of coarseness; ¾" shanks. Consult your industrial distributor. Meantime, write for prices and literature.

## NICHOLSON ROTARY FILES CHOLSON

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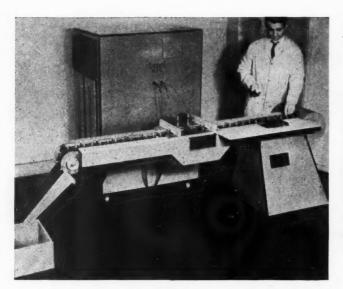


Illustration depicting application of Lepel Conveyor Belt Table

fastening of interchangeable supports to hold various shaped workpieces in place. The load coil, shown in the center of the table, is movable and can, for example, be placed at the extreme left of the conveyor belt for hardening applications, at which point the part falls directly into a quenching tank (not shown).

Lepel Conveyor Belt Table

Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York, N. Y. has announced a conveyor belt table for use in conjunction with any Lepel high frequency unit or other makes of induction heaters for the efficient handling of workpieces for brazing, soldering, annealing, hardening, and so on. The accompanying illustration shows the table being used in annealing the top edges of hardened steel wedges, 4 inches long x ¼ inch thick, for the purpose of reworking.

The conveyor belt is powered by a ¼ h.p. motor, and the belt speed may be regulated over a wide range to accommodate a variety of applications. The design of the conveyor belt allows for the

Lyon-Raymond Tilling-Type Hydraulic Strip and Sheet Feeding Table

As an addition to its line of hydraulic strip and sheet feeding tables, the Lyon-Raymond Corp., 3518 Madison St., Greene, N. Y., announces a model with an adjustable tilting top for use with inclined presses, as well as horizontal bed types. The unit is available in a 2,000-lb. capacity with table widths of from 12 to 24 inches and lengths up to 96 inches (including the removable extensions). From a flat position, the table top may be adjusted to a 30-deg. tilt with several intermediate positions.

In operations involving inclined



## TO RAISE PRODUCTION — CUT COSTS THE READING BROACH KEYSEATER

The Reading Bench Machine does not require bushings or guides. No other machine like it. Very fast—capacity from 1/8 to 3/8 cutter.

Low first cost—prompt delivery.

READING MACHINE COMPANY

Reading (Cincinnati), Ohio

A Few Facts You Should Know

About

#### SIMPLE CONSTRUCTION . EASY TO OPERATE . FACTORY TESTED

To understand the operation of the "Acorn" Die, one should see it in relation to the "Acorn" Die Holder as pictured at the right in sectional view. The feature which makes the "Acorn" Die so convenient and accurate is the manner in which the four prongs or threaded ands are compressed when the holder cap is screwed down onto the holder. As all bearing surfaces on the holder and die are ground to insure correct alignment and accuracy, even pressure is brought to bear on each of the prongs simultaneously so that they all adjust equally and concentrically. This is done quickly and automatically by tightening the cap and turning up the lock

nut. No other adjustments are necessary.

A positive adjustment to size can be obtained by using the threaded plug which comes with every "Acorn" Die. This plug has actually been threaded by the die in which it is shipped and has been carefully checked for accuracy. Thus, if it is used as a setting plug, accuracy of the set up will be assured. For close to shoulder work, quick change over of jobs, accurate threads,

specify "Acorn" Dies to your local Greenfield Distributor.

### HOLDERS ADAPT "ACOTA" Dies FOR ANY MACHINE



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#### REGULAR

Regular "Acorn" Die Holder with longitudinal float which allows the die to follow its own lead independent of any lag in the machine. This holder may be used on practically all automatic screw machines and any other machines which provide for automatically reversing the die or rod at the instant when the desired length of thread has been cut.





Releasing "Acorn" Die Holder, while suitable for all machines, is especially recommended for hand operated machines. The improved clutch mechanism allows the holder to be released without shock.

#### ADAPTER



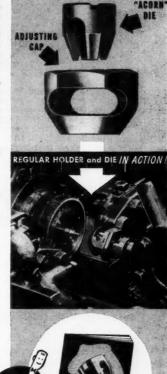
The "Acorn" Die Adapter permits the use of "Acorn" Dies with existing round die holders. It consists of three parts, a Cap to hold and adjust the die, a Lock-Nut to secure the adjustment and a Body. The shank fits round or spring die holders of corresponding size.



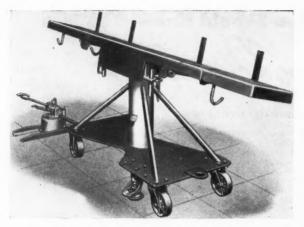
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12 PAGE "ACORN" DIE BOOKLET!

and DIE CORPORATION . Greenfield . Massachusetts its New Haven Division The GEOMETRIC TOOL COMPANY



LOCK



Lyon-Raymond Tilting-Type Hydraulic Strip and Sheet Feeding Table

## Columbia Squaring Shear

Product of the Columbia Machinery and Engineering Corp., Hamilton, Ohio, the Columbia Squaring Shear illustrated herewith incorporates longer shear blades than are normally required for cutting full width material so as to provide an opening on one end equal to the maximum thickness of material and thus

eliminate tearing or nicking when notching or trimming sheets longer than the blades. No adjustment is necessary in order to change the manner of shearing. The upper blade holder includes a heavy brace with provisions for readily adjusting horizontal alignment of the upper blade.

All principal members of the Colum-

presses, the Lyon-Raymond Tilting-Type Hydraulic Strip and Sheet Feeding Table can be used to feed strip or sheet stock at the correct angle with full support and proper leveling. When the correct angle of tilt has been determined, the table top can be firmly locked in position by removable pins. The table top is free to elevate and lower at all times.



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## DI-ACRO BENDERS

DI-ACRO precision bending is accurate to .001" for duplicated parts. DI-ACRO Benders bend angle, channel, rod, tubing, wire, moulding, chanstock, etc. Machines are easily adjustable for simple, compound and reverse bends of varying radii.

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#### "DIE-LESS" DUPLICATING

showing many kinds of "DIE-LESS" DUPLICAT-ING produced with DI-ACRO Benders, Brakes and Shears.





## A Centered EYE in 1 Operation

The DI-ACRO Bender makes perfectly centered eyes from rod or strip stock at a high rate of production. Both eye and centering bend are formed with one operation. Any size eye may be formed within capacity of bender and ductile limits of material.

#### BENDER No. 1

Forming radius up to 2". Capacity 3 / 16 ...

round cold rolled steel bar or equiva-lent. All DI-ACRO Benders have two-way action, right or left hand mounting and reversible forming nose.



#### BENDER No. 2

Forming Radius up to '. Capacity round cold rolled steel bar, formed cold to l' radius. Di to 1" radius. DI-ACRO Benders form bus bar and other strip stock both flat and edgewise.



### BENDER

No. 3 Forming radius up to 9". Capacity 1/2" round cold rolled steel bar, formed cold to 1" ra-dius. Bender No. 3 is especially designed for aircraft,

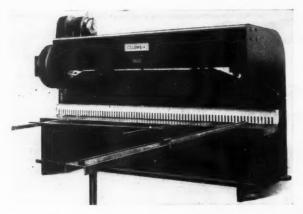


marine and other large radius bending. Pronounced "DIE-ACK-RO"



O'neil-Irwin mfg.co.

306 8th Avenue, LAKE CITY, MINNESOTA



bia Squaring Shear, such as the housing, base, table, slide, top cross die, and so on, are fabricated of rolled steel plate to provide for high strength and maximum rigidity and accuracy. Gears are precision machine cut, the first gears having helically cut teeth, and operate in oil in an oil-tight case. The eccentric shaft is a heat-treated high-carbon steel forging

with eccentrics forged integral with the shaft. A six - jaw clutch of alloy steel with hardened faces and automatic cam stop operates on the squared end of the eccentric shaft, making a positive, rigid driving connection. A centralized lubricating system provides positive lubrication to all main bearings.

An easily - read stainless steel scale is mounted in the shear table, and each machine is equipped with a mechanically-

operated automatic hold-down with individual high-compression spring compensating fingers and a dependable finger guard located in front of the shear blade. The standard throat depth is 18 inches, and the shear is made in 3 sizes. The 6-foot size is designed to shear ¼-inch mild steel at 60 strokes per minute and the 10-foot and 12-foot sizes are de-





DRILL CHUCK

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"This modern ALCO Drill Chuck has made it possible for us to meet some of the toughest production schedules we ever had to face.

"When we equipped our screw machine department with ALCO Holders, it was the smartest move we ever made, and one of the biggest savings was in eliminating our bushing inventory; because these ALCO Holders have a tight grip without using bushings. "We only need a comparatively few of these tools to do all our work for we use the same ALCO Chuck to hold drills, counter bores, reamers and spotters.

"One thing which makes these tools outstanding is the adjustment for concentric drilling or reaming. Even on our old machines, we turn out perfect work and have no rejects because of this concentricity."

Write for new catalog No. 6

## ALCCATOOLS

THE ALCO TOOL CO.

152 Birdseye St., Bridgeport, Conn.

Detroit Office: 908 Stephenson Bldg.

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signed to shear 3-inch mild steel at the

same speed.

The Columbia Squaring Shear is ordinarily furnished with flywheels for belt drive but can be furnished with high-torque, high-slip or general-purpose motors of suitable size with enclosed V-belts and pulleys for individual motor drive. Other accessory equipment including a 24 or 36-inch range micrometer back gage adjustable by  $\frac{1}{64}$  inch and with provision for taper shearing, a 10-foot range squaring arm with steel scale and adjustable gage finger, and a front gage with 50-inch range can be installed on the shear by the manufacturer.

## Progressive Press Type Spot and Projection Welders

A complete line of improved roller-head press type spot and projection welders in capacities ranging from 50 to 500 k.v.a. has been announced by the Progressive Welding Co. 3050 E. Outer Dr., Detroit 12, Mich. An outstanding advantage claimed for the machines is that they are equally adapted to continuous high production runs and to the handling of various types and sizes of work on a job-lot run basis. Provision can be made for pulsation weld-

ing, resistance-upsetting, and resistance brazing, as well as for pre-heating, postheating, or tempering the work while still in the machine.

In the machines, the frames are designed in two sections. The forward section of the frame, which has to take all the high stresses incident to resistance welding with high pressures, is of massive construction and is heavily reinforced and braced. To this section are attached the head, knee, platens, and arms. Welding transformers are also supported from this frame section. The rear section of the frame is of relatively lightweight construction and is actually a removable sheet metal enclosure. As a result, the interior of the machine is completely accessible for any work to be performed on controls, electrical connections, and so on.

The ram itself is of high strength light alloy for low inertia and high operating speeds. Strongly ribbed to prevent deflection, it is supported and guided in V-shaped ways by eight large diameter preloaded anti-friction rollers. Since the rollers are on the ram rather than on the guides, there is said to be no variation in the relative position of electrode to ram supports at any point of the stroke. The use of hardened and precision ground V-type ways further counteracts the bend-





Yes, your molybdenum, tungsten and cobalt high speed steel cutting tools will hold their cutting edges longer when hardened the Sentry Way. The approved Sentry Diamond Block Method of Atmospheric Control assures maximum hardness and uniform quality, no decarburization.

Sentry Electric Furnaces offer great flexibility, are economical

to operate, quick to heat up, require no special skill and insure clean, bright, scale-free, dimensionally correct work. There is a size and model Sentry to meet your requirements.

Visit the Sentry Booth No. 543 at the Metal Show OCTOBER 18-24. See a Sentry Furnace in operation. Bring samples of your cutting tools for demonstration.



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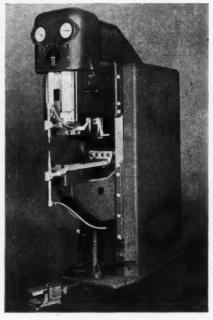
New 12-page, instructive catalog on request. Ask for bulletin 1054-E4.

The Sentry Company Sentry DIAMOND FOXBORO, MASS., U.S.A.



ing moment when pressure is applied for welding, particularly when the electrodes are a considerable distance in front of the ram.

Machine operation is obtained through either air or hydraulic actuation, on all sizes up to 250 k.v.a. On larger machines, hydraulic operation is standard. All machine sizes are available with throat depths of 18, 24, or 30 inches for projec-



Progressive Roller-Head Press Type Welder

tion welding and 18 and 36 inches for spot welding.

Size No. 1 machines (50 and 75 k.v.a.) are offered in two styles; namely, a spot welder and a projection welder. The projection welder type of machine is readily convertible for spot welding merely by adding spot welding horns, electrode holders, and electrodes. Sleeves and spacers for the mounting of the horns are provided as standard in the platens. The straight spot welder with its swiveling lower arm is also convertible to projection welding, although this requires the addition of a projection welding type lower knee and upper and lower platens.

Machines ranging from 100 to 250 kva



## GRIPPING FORCE 15 TIMES AIR LINE PRESSURE

Speedy Air Vise helps you do dozens of operations faster, better, cheaper-by air pressure! Foot control valve opens and shuts vise instantly, leaving both hands free to produce more! Jaw opens up to 3 inches, holds castings, parts, jigs, etc. Compact, trouble-free, inexpensive.

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are offered as combination machines. On these both projection and spot welding can be performed, the machines having T-slot platens and sleeves and spacers for mounting spot welding hor.is.

Other features of the machines include key aligned knee to assure accurate alignment and rigidity; hydraulic jack to quickly adjust height of lower knee when changing over from one job to another; diaphragm controlled cylinder packing to ensure consistent welding force; fast follow up, and so on; direct reading pressure gage which shows welding force as well as air pressure; insulated upper head construction to eliminate the need of insulating any fixtures mounted on the lower knee; secondary coppers protected by boots to prevent any flash from reaching the secondary connections; full size door on left side for access to interior of machine; keyed head for rigidity; completely clear right-hand of machine to permit mounting of controls on this side of the machine for convenience in operation; separate cooling systems for electrodes, secondary members, and transformers; only four points of lubrication on the entire machine; and adjustable stroke and adjustable-retractable stroke cylinders available as extra equipment.

## Brown & Sharpe Redesigned Nos. OOG and OG Automatic Screw Machines

According to an announcement made by the Brown & Sharpe Mfg. Co., Providence 1,, R. I., Brown & Sharpe Nos. OOG and OG Automatic Screw and Automatic Cutting-Off Machines have been redesigned to increase production and efficiency. A larger Brown & Sharpe Automatic, the No. 2G (with 1 or 1½-inch capacity spindle), also includes these features.

The spindle is positively driven at all speeds by multiple-width roller chains from the speed and ratio change gears in the base, with the mechanism completely enclosed. The spindle driving chains have predetermined tension adjustment for maximum chain life and remain unchanged for all combinations of speed and direction of spindle rotation. The spindle is of unit construction and may be readily removed if necessary. It is compact, without weighty mechanisms, and is mounted in precision anti-friction bearings at both the front and rear. The rear box contains a preloaded ball bearing which provides for both end-thrust and lift. Sprockets have, hardened steel



## "Air Devices by Redmer"

## ed e Index Chuck with Air Operated Collet

Eliminates removing chuck from base of machine for changing index position. Index screw posts located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".



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## Air Foot Control and Valve

Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot



No. FC-28

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pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



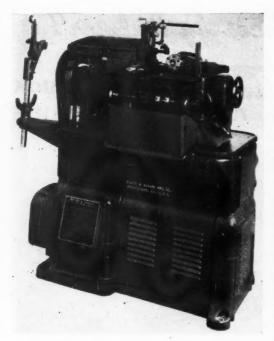
## Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 31/2". AVAILABLE WITH AIR EJECTION OR OIL FLUSHING.

Write for literature and prices

## REDMER AIR DEVICES CORP.

9204 W. BELMONT AVENUE, FRANKLIN PARK, ILL.



Brown & Sharpe Redesigned No. 00G Automatic Screw Machine

bushings and turn on precision roller bearings on spindle.

Spindle speeds in 196 two-speed combinations are provided in 16 groups, each group having a high speed with which any one of 12 low speeds can be used in combination. Approximate ratios of high to low speeds range from 1.6:1 to 13:1 except for the highest and lowest high speeds where ratios range from 1.6:1 to 11:1. Such a wide selection of ratios permits using correct threading or tapping speeds without limiting the forming,

drilling, or other high turning speed operations. The broad range of high speeds, plus the unusually wide choice of corresponding low speeds, permits equally high cutting efficiency on materials ranging from alloy steels to free-cutting plastics and on the widest ranges of work diameters.

High and low speeds can be forward and backward, both the same direction or in opposite directions (except the 10 combinations providing highest total r.p.m. which can be used only in the same direction). Changes in high speed and ratio are each made by changing one pair of pick-off gears in respective compartments in the base. same set of 16 gears provides all the changes of speed and ratio. The direction of high speed is controlled by a manual, built-in reversing switch. The direction of low speed, rela-

tive to high speed, is changed merely by moving a ratio change gear from one center to another. Provision is made to reduce the speed of the driving shaft, when desired, so that additional feeding length can be obtained. This also permits increasing the production time per piece for one cycle, if necessary.

When the number of operations required to produce the part permits, faster production can be obtained by designing the cams and setting the trip dogs to make more than one piece per cycle.



## **Immediate Delivery!**

Standard Size Dowel Pins from ½" to 1" diameter and from ½" to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

Dealer inquiries invited.

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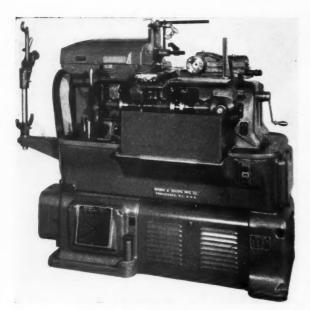
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Brown & Sharpe Redesigned
No. 0G Automatic Screw
Machine

Thus, the most efficient production rate is available for any piece within the ability of the machine to produce. Idle machine movements such as feeding stock, changing speed and indexing turret are performed at a constant rapid rate independent of the spindle speed or rate of production.

The swing stop for stock, independent of the turret, is operated in conjunction with the feeding mechanism and requires no extra time. It leaves all six turret holes available for operating tools, and permits using a single tool without indexing. The electrical controls conform with Lachine Tool Electrical Standards and

are built into the machine where they are well protected, yet easily accessible. Overload relays with manual reset are provided.

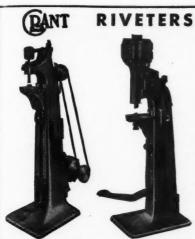
The combination magnetic starter and disconnect switch is mounted in a dust-proof compartment in the rear of the machine. When the lever on the compartment doors is turned to allow the door to open, a safety device operates a disconnect switch and shuts off the current.

Major mechanisms and bearing surfaces throughout the machine receive automatic lubrication. The entire driving mech-

anism in the base is oiled by a splash system, while the main spindle bearings and other mechanisms receive forced feed lubrication from a chain-driven mechanical oiler. The oiler operates whenever the machine driving motor is running, and is reached for checking the oil gage or refilling simply by lifting off a guard.

Various safety mechanisms further ensure the long life of the machine. For example, a spring safety device in the stock feeding mechanism serves to prevent breakage in case of any interference with the advance of the feed tube. Again, a clutch automatically disengages the





 Pioneers in the riveting field. Head rivets from smallest to 3/6" diameter, either by noiseless spinning or vibrating hammer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles. Write for literature—and don't forget to send samples.
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Representatives LESTER Injection Molding Machines

Ask Standard Tool of Leominster to help solve your problem of specially designed equipment. For more than 36 years, our craftsmen have concentrated on the "growing" problems of plastics production, designing and producing tools and equipment that have played an important part in the success of this industry.

This knowledge and experience can help you save time and cut costs without reducing the quality of your product.



Motorized Ball Bearing Beveler

### LEOMINSTER. STANDARD TOOL MASS., U.S.A.

OUTFITTERS TO PLASTIC MANUFACTURERS SINCE 1911 Specialists in designing and building Plastic Molds



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### **Bench or Floor Models**

"T" square design eliminates the usual intermediate table. Only one oil film is subject to grinding pressure assuring accurate surfacing and quality finish.

Large Capacity: Full 10" from Table to Bottom of 7" Wheel.

Precision Spindle. Large Bronze and Precision Ball Bearings.

J. B. CROSMAN & SON. Inc. EAST WALPOLE, MASS.

drive to the camshafts if the toolside mechanisms are subjected to excessive strain; and the constant-speed driving shaft and its driven mechanisms are protected by the shock-absorbing characteristics of the leather driving belt.

Specifications of the No. OOG machine are as follows: hole through largest regular-capacity feeding finger, % inch diameter: single movement of feeding mechanism feeds any length to 1 inch when using 240 r.p.m. driving shaft speed and any length to 2 inches when using 120 r.p.m. driving shaft speed (greater lengths fed by successive movements); movement of turret slide permits turning any length to % inch; maximum distance, face of collet to turret, 218 inches; minimum distance, 1% inch; horizontal distance, center of tool holes in turret to side of turret slide, % inch; spindle speeds, 6,050 to 50 r.p.m.; machine driving motor, 2 h.p.; net machine weight, 2,200 pounds.

Specifications of the OG machine are as follows: hole through largest regularcapacity feeding finger, % inch diameter; single movement of feeding mechanism feeds any length to 2 inches when using 180 r.p.m. driving shaft speed and any length to 3 inches when using 120 r.p.m. driving shaft speed (greater lengths fed by successive movements); movement of turret slide permits turning any length to 11/4 inches; maximum distance, face of collet to turret, 51/8 inches; minimum distance, 21/2 inches; horizontal distance, center of tool holes in turret to side turret slide, 1% inches; spindle speeds, 4,230 to 35 r.p.m.; machine driving motor, 3 h.p.; net machine weight, 2,975 pounds.

The automatic cutting-off machines are the same as the automatic screw machines except for the use of a single toolslide in place of turret.

### Michigan Improved Rack Type Gear Finisher

An improved rack type gear finisher which is designed to permit the simultaneous finishing of two or more gears in tandem has been announced by the Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. Hydraulic in operation, the machine has a duplex head and tailstock, permitting one gear to be mounted between centers and another on a stub arbor immediately ahead of the centers. The hydraulic clamping provided for the centers is interlocked with the machine operation so that the machine cannot be



PRODUCTION MACHINE CO.

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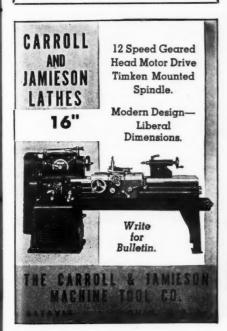
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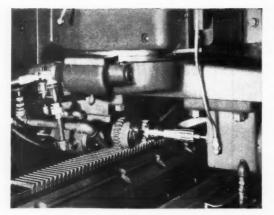
The durable Doyle Vac-It is constructed to handle any cleaning job in your plant efficiently and without the necessity of changing parts. Wet and dry cleaning jobs are all the same to the Vac-It. Dirt and dust are removed from plant and office floors and walls . . . overhead pipes, production line machinery and installations are quickly cleaned and kept free from clogging dirt and metal scraps with the Doyle Vac-It and Doyle equipment. The Vac-It does not push dirt around . . . it picks it up and removes it from the plant.

The powerful suction of the Vac-It also recovers lubricants, coolants or water at the rate of 720 gallons per hour.

Vac-It will make all your cleaning jobs easier, faster and less costly.



3225 Stevens St., S. W. Grand Rapids 7, Michigan



Close-up view of Improved Rack Type Gear Finisher showing its use in finishing two gears simultaneously

Gear Finisher is said to handle

most passenger car or truck transmission gears. The gears are mounted at a "crossed axis" to the axis of the serrated rack blades and are given a transverse motion while rolling in mesh with the reciprocating Rack blades, of course, have the same pitch and pres-sure angle as the gears to be finished. During the shaving operation, the machine head gradually feeds down until proper size has been reached,

the machine reciprocates a few more times and then stops for reloading. Cycling is completely automatic.

started until the gears have been mounted. Quick-lock type mechanical centers are also available on the machine.

To shave two or more gears at a time, the gears, of course, must be of the same pitch and pressure angle. They may, however, be of different diameters and face widths.

The Michigan Improved Rack Type

## Benjamin Centering Automatic

Product of the Stanford-Roberts Manufacturing Co., 619 E. Iron Ave., Dover,





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SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments... no bearings, friction, heat or loss of power. Instant release without stopping lathe.

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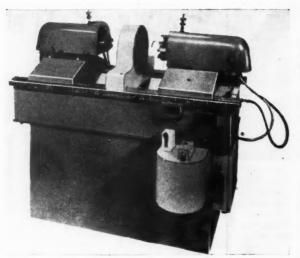
STACKBIN

"Stacked and



SYSTEM

Still Accossible"



Ohio, the Benjamin Centering Automatic illustrated herewith can be used for facing, centering, drilling, turning, and threading both ends of a shaft simultanBenjamin Centering Automatic

eously. It can also be used for boring and beveling tubing. Fixtures may be attached to either end of the center drive chuck for holding work other than shafts or tubing so that two pieces can be machined simul-

taneously.

Designed for quick and easy setting up, the Benjamin Centering Automatic has a capacity for shafts from 1/8 to 11/2 inches in diameter and from 5 to 30 inches in length. Concentricity of shaft center holes is said to be assured by the revolving workpiece. The chucking and machining cycle is fully automatic,

thus permitting both ends of the work to be drilled at one time. The center drill point is self-oiling and cleaned by forced

air application.

## OIL GROOVING made easy by WICACO

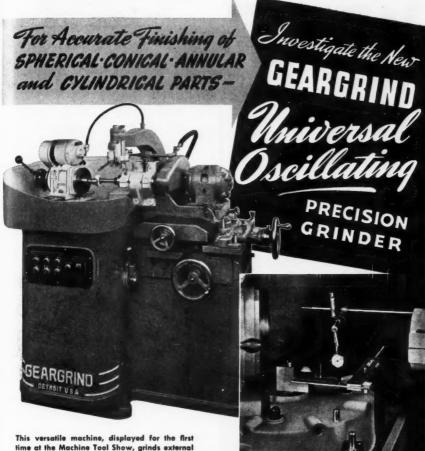
The WICACO Continuous Oil Groover can cut grooves of all descriptions INTERNAL or external - CON-TINUOUS or intermittent.

Operators need no special training to produce oil grooves with this highly flexible machine. Change from one grooving job to the next is readily done without delay. Its upright spindle and chuck permit rapid loading and unloading of work without stopping the machine.

It will pay you to investigate the remarkable, low cost results the WICACO Continuous Oil Groover offers. Write today-outline your oil grooving problem and complete information will be sent without obligation.

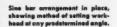


Stenton Avenue and Louden Street, Phila. 44, Pa.



This versatile machine, displayed for the first time at the Machine Tool Show, grinds external and internal cylindrical surfaces, generated or formed spherical external and internal surfaces, external conical surfaces, internal tapers, ball bearing races and fillets.

With a single set-up combinations of the above may also be ground, securing perfect blending of straight and curved surfaces and extreme accuracy.



Worktable clamping device, with micrometer adjustment.



Write for Literature

Illustrates many set-ups and gives full information and specifications.

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Removes 96% to 97% of All Water, Dirt and Scale from Airline.

Air passes through a series of brass discs with .002 spacings, providing the finest degree of filtration obtainable. Then as the air passes through head of Lubricator, oil is de-

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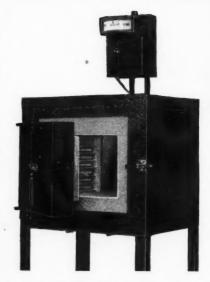
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MARVEL TOOL & MACHINE CO.

Detroit 12, Mich.

### Lucifer Model DL 7052 Electric **Heat Treating Furnace**

Introduction of an electric heat treating furnace designated as the Lucifer Model DL 7052 is announced by Gilbert S. Simonski, Lucifer Electric Furnace Division, Terminal Commerce Bldg., Philadelphia 8, Pa. According to the manufacturer, the outstanding feature of the furnace is 100 per cent automatic electronic control that simplifies opera-



Lucifer Model DL 7052 Electric Heat Treating Furnace

tion by permitting one knob to be used for determining the temperature to be attained and maintained.

The Lucifer Model DL 7052 Electric Heat Treating Furnace is regularly furnished in a floor model but can be obtained in a bench model if desired. The furnace has an operating temperature range of up to 2,000 deg. F. and rating of 6.5 kw. The usual muffle area is 12 x 12 x 10 inches.

## La Bahn Automatic Roll Feed

The La Bahn Machine & Manufacturing Co., 544 Lincoln Highway, Menlo Park, N. J., is now manufacturing a roll feed for automatically feeding stock into punch presses. Built for heavy duty, the unit is made in various types to meet

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# The A-B-C of Flexible-Shaft Finishing as seen at Chicago

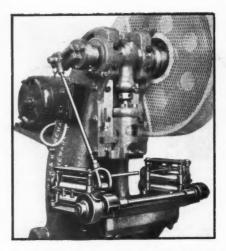
A new conception of flexible-shaft finishing and the P&W engineering behind it was gained by hundreds of visitors at the big P&W Booth at the Machine-Tool Show. They saw P&W Kellerflex Machines using P&W Carbide Burs, cutting everything from cast iron to hardened dies. They saw new versatility in the ever-broadening line of Kellerflex accessories . . . always in step with industry's needs.

They took with them the three booklets illustrated ... A—the Kellerflex Machine and Attachment Catalog; B—the "Burology" Booklet which provides the basis of modern finishing practice; C—The Keller Bur and Accessories Catalog. If you missed them at the Show, write today for the A-B-C of flexible-shaft finishing—any or all three of the booklets.

PRATT & WHITNEY
Division Niles-Bement-Pond Company
KELLERFLEX SALES DEPARTMENT

WEST HARTFORD 1, CONN.





Close-up view of LaBahn Automatic Roll Feed installed on a punch press

practically every requirement of feeding stock from colls or strips and to fit all sizes and makes of presses. The outstanding feature claimed for the La Bahn Automatic Roll Feed is its simplified method of operation which is said to eliminate complicated parts and ensure rapid, smooth, and accurate feeding under all conditions. The rolls in the unit are arranged to turn only when the stock is being fed into the press and, at the end of the forward movement, the rolls are separated by a lifter which is actuated by the ram of the press to ensure that the exact amount of material is fed into the press.

Power for driving the feed is transmitted by a crank disc which is mounted on the crankshaft of the press and is adjusted to obtain the exact amount the stock is to be advanced. The lower feed roll is driven by a friction drive assembly which is mounted on the lower roll and in turn drives the upper roll by means of a pair of cut steel spur gears which are The upper roll is constantly in mesh. mounted in floating bearings which are guided by four steel posts, and is held in contact with the stock, while feeding, by means of four adjustable compression springs. To eliminate the possibility of too much stock being fed into the press during the stamping operation, the upper roll is raised by a lifter operated by a lev-





## AUTO REVERSE TAPPING CHUCKS



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MULTIPLE TAPPING HEADS

CLUTCH OR CONE-DRIVE TAPPING CHUCKS

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Speedy Sturdy Dependable

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## FEEDS PARTS WITH SURPRISING EFFICIENCY

Screws, Screw Blanks, Rivets, Pins, Discs, Nuts, Bearing Rollers, Steel Balls, Washers, and special parts adaptable to hopper.

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DETROIT POWER SCREWDRIVER CO.

er which comes in contact with the ram on the downstroke. Included in the feed mechanism is a brake which is said to prevent excessive turning of the rolls due to momentum.

According to the manufacturer, the La Bahn Automatic Roll Feed can be used in the feeding of coiled or strip steel, brass, copper, aluminum, paper, mica, rubber, leather, fiber, and so on. Capable of handling various stock thicknesses and widths up to the width of the feed rolls, the unit is designed for mounting on the press in any desired position. The direction of the feed can be easily changed by merely reversing the friction drive housing on the drive shaft. Feeds for special applications can be supplied on order.

### Matco Radius and Angle Wheel Dresser

The radius and angle wheel dresser now being manufactured by the Matco Tool Co., 2834 W. Lake St., Chicago 12, Ill., can be used in forming concave or convex radii with any two angles tangent in one continuous motion. With the aid



Matco Radius and Angle Wheel Dresser

of a micro diamond adjuster, the diamond can be set to tenths of an inch for obtaining fine accuracy.

Having all wearing parts hardened and ground, the Matco Radius and Angle







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These two modern bench-type machines supplement each other . . . are especially adapted to "internal" operations.

## The MILWAUKEE DIE FILER

is used for fast, accurate, straightline, sharp-corner filing, sawing and lapping in the softer metals preparatory to hardening.





## The MILWAUKEE PROFILE GRINDER

is used for precision finishing of hardened steel parts, and for grinding curved surfaces and irregular contours.

Milwaukee Chaplet & Manufacturing CO.

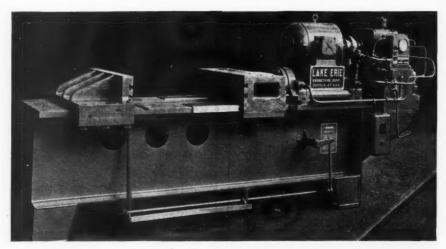
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Lake Erie 50-Ton Hydraulic Bulldozer

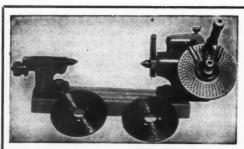
Wheel Dresser features micrometer feed to the wheel for precision dressing. The special tip-back column feature is said to eliminate the necessity for removing the dresser from the table. Completely dust-proof, the dresser can also be obtained with a sub-base for T-slot machines.

## Lake Erie Hydraulic Bulldozer

The Lake Erie Engineering Corp., Buffalo 17, N. Y., announces the availability of a hydraulic bulldozer in a wide range of types and sizes for both standard and special applications. The machine is designed and built as a compact, self-contained unit that can be placed in operation or moved to new locations when necessary with a minimum of delay.

The Lake Erie Hydraulic Bulldozer is foot-treadle operated. Pressure on the treadle advances the crosshead. The crosshead can be stopped and returned at any point in the stroke, merely by releasing the treadle. Auxiliary and double-acting traverse cylinders provide for rapid approach and return of the crosshead. Any portion of the stroke can be used with full pressure at any point. The hydraulic system employed is said to eliminate danger of breakage through overloading.

The frame of the bulldozer is constructed of heavy welded sections. Deflection under full load is negligible and close die alignment is assured at all times, the manufacturer claims. Standard equipment includes adjustable stroke stops, automatic pressure control on pumps, air and oil filters, and pressure gages.



## IMMEDIATE SHIPMENT FROM STOCK PLAIN DIVIDING HEAD

6" swing. Overall length 6¾". Base 3½x 2x3". Spindle has No. 7 B & 5 taper and take-up collar for end thrust. Threaded spindle nose 1½" dia., 12 thds. U.S.S. Plates cover entire range of B & S chart. Worm wheel ratio 40:1. Complete with 3 dividing plates, 4" dia., one 24-netch indexing plate and talistock. Write for catalog of machine tools and attachments.

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"Dalbo" couplings and fittings are expertly machined from solid bar stock. They are rustproof and are completely tight under any pressure upward from 10 pounds. The "Dalbo" locking sleeve prevents accidental uncoupling.

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This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. 4x36½" band. The ideal portable unit.

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## Morton High Duty Draw Cut Light Type Flash Trimmer

A high duty draw cut light type hydraulically driven flash trimmer which is designed for removing the flash or upset from resistance or butt welds is now being marketed by the Morton Manufacturing Co., Broadway and Hoyt, Muskegon Heights, Mich. The machine is built in sizes with trimming capacities of from 8 to 12 inches and for accommodating metal up to ½ inch thick.

The Morton Flash Trimmer has an operating distance of approximately 40 in-



Morton High Duty Draw Cut Light Type Flash Trimmer

ches from the center of the rams to the floor, and can be provided for either flat strip or circular bands. The operating cycle of the machine is automatic. The work is placed over the lower horn and the foot starter depressed, thereby causing the upper ram to automatically lower and clamp the work. The rams trim on the draw cut or inward stroke and, when the trimming operation is completed, the upper ram automatically lifts 11/2 inches and both rams return to the outward position and stop. The operator can remove the work as soon as the unclamping operation is initiated and place another piece in trimming position.

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TO INSTALL
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VIMCO MFG. COMPANY, Inc.

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Anyone can operate a Dahlstrom Tap Guide. Just fasten it to a post, slip a Tap Adaptor into the spindle and turn the handle. Cuts tap breakage down to zero. \$52.50 F.O.B. Minneapolis, including 7 Adaptors. At mill supply houses, or Dahlstrom Mfg. Co., 418 South 6th St., Minneapolis 15, Minn. Ask for circular.

Dahlstrom TAP GUIDE

## MAXIMUM PRODUCTION IN CHUCKING AND INDEXING

With the new Dearborn Automatic Indexer connected to a Dearborn Chucking Fixture: chuck is closed automatically; indexed the required number of times automatically; chuck is opened automatically; piece is knocked out automatically.



Write for further information.

When used with the Dearborn Degree Indexing Fixture it can quickly be set to index any number of degrees from 30° to 90° at one indexing and then knock out, or it can be set to index from no degrees to 90° and then not knock out.

J. W. DEARBORN

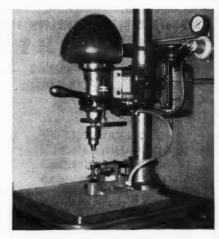
Ansonia, Conn.

Each ram is provided with three or more toolholders, depending upon material thickness and analysis. Adjustable bit type cutters of special design with fine pitch screws for cutter adjustment are used. A Morton electric cutter grinder unit with gages and fixtures for the economical maintenance of cutting tools is offered with the machine.

### "Por-Matic" Air-Operated Universal Drilling Fixture

Known as the "Por-Matic," an air-operated universal drilling fixture of rigid and sturdy construction is now being marketed by the Porter Machine Corp., 3139 Enyart Ave., Cincinnati 9, Ohio. The design of the fixture includes a semi-steel casting; the piston bore is lapped to a very smooth finish, and the threaded elevating table that supports V-blocks is provided with a close fit but is free moving to aid in rapid setup for work of various diameters.

The Por-Matic Fixture is designed to handle round stock from 1 to 1 inch in



"Por-Matic" Air-Operated Universal Drilling Fixture Mounted on Drill Press

diameter and, by using a special upper beam or drill bushing carrier, 1½-inch diameter stock can be accommodated for cross drilling. The fixture can be readily



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## INSIDE DEBURRING CUTTERS



30° - 45° STOCKED IN 8 SIZES EACH ANGLE



SPECIAL ANGLES
FROM STOCK BLANKS





FOR HAND USE (4 THREAD SIZES)

RADIUS TYPE 10 SIZES

SEVERANCE TOOL INDUSTRIES INC.

724 IOWA STREET

SAGINAW, . MICHIGAN

mounted on practically any of the conventional bench or floor type drill presses. The air injector valve can be mounted on a flat strip of steel and bolted to the side of the drill press head. The valve stem is actuated by another piece of steel that can be bolted at the bottom of the depth adjusting screw incorporated in small drill presses. When the drill press spindle is at full upward travel, the valve plunger is closed, exhausting the air from the drill fixture cylinder immediately. The drill bushing beams then tilt back to the desired opening at the drill bushing ends so as to allow for removal of the part that has been previously drilled and for the insertion of a new

The piston of the Por-Matic Fixture is made from a special composition which is said to be resistant to any acid or oil contact. The drill bushing beam is made in two parts of high grade steel, the upper part containing an inverted liner sleeve which holds the work in the V-block and is independent of the drill bushing or guide. The upper beam is also arranged for %-inch lateral adjustment for off-center drilling and can be reset instantly for center drilling when desired. Three V-blocks are all that are

said to be required in order to handle stock from  $\frac{1}{16}$  to  $1\frac{1}{2}$  inches in diameter.

The drill bushings used in the fixture are of the slip type and can be easily interchanged. Hole sizes range from No. 30 up to and including  $\eta_2^2$  inch. A small needle or speed valve is incorporated in the fixture to allow for regulation of the beam or locking pressure on small thinwall or tubular parts.

### Diebel 12-Ton Hi-Speed Automatic Press

A 12-ton high speed automatic press with automatic roll feed and variable speed drive has been added to the line of Diebel Hi-Speed press equipment produced by the Di Machine Corp., 2711 W. Irving Park Rd., Chicago 18, Ill. The press is designed to accommodate standard die sets measuring to 8½ x 6½ inches or special die sets measuring to 8 x 12 inches.

The shut die height over the bolster plate is 6 inches. The adjustable automatic roll feed mechanism, which is operated by means of an eccentric body on the crankshaft, is an integral part of the machine. Stock up to 4½ inches



## Get STANDARD Tapered Cutters on the job Fast!

for Machining all Types of Dies, Molds, Patterns requiring Draft . . .

Now . . . a complete standard line of H.S.S. tapered spiral cutters stocked for immediate delivery! They save time waiting for "specials". they save the extra cost of "specials". Available in sizes from 1/2° to 7° taper per side, 1/2" to 31/2" flutes.



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Much heavier cuts can be taken without damage to tool point or work. More uniform cutting action — better threads. Adjustment of spring pressure can be made while cutting threads. Parts surface hardened and treated to prevent rust.

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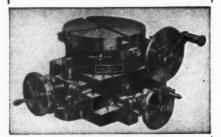
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We also make a No. 2 Size for 12" Rotary Table. Can be had without

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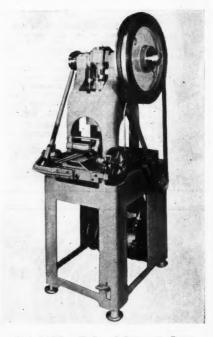
482 Canal St. New York 13, N. Y.

High Speed COUNTERBORES BACK SPOT **FACERS** Interchangeable Catalog Request BICKNELL-THOMAS COMPANY

Massachusetts

may be employed, and the length of the feed is adjustable to 6 inches. The feeding mechanism is said to provide accurate feeding for the use of progressive dies, as well as for the use of blanking or compound dies. The variable speed drive permits operation of the press between 65 and 300 strokes per minute.

Standard equipment of the Diebel 12-Ton Hi-Speed Automatic Press includes a clutch for single-stroke operation,



Diebel 12-Ton Hi-Speed Automatic Press

automatic brake release, hardened and ground feed rollers, knockout bar in the ram, stock guides, motor, and starter. Power is supplied by a 1½ h.p., 1,725 r.p.m., 220-volt, 60-cycle, 3-phase, a.c. motor mounted under the bed. The press is available with a 1, 11/2, or 2-inch stroke and occupies a floor space of 32 x 40 inches. The machine has an overall height of 66 inches.

### Tinker's Thread Grinder

Recommended for use in the grinding of threads of any shape on any standard

Greenfield



Forthman Scrapers are tipped with super-hard CARBOLOY CEMENTED CARBIDE to resist wear and hold keen cutting edge over longer periods of continuous use! In terms of user benefits, this means

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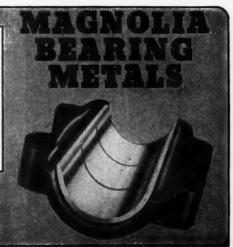


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Both have unusual malleability, strength and toughness to stand severe hammering shock stresses without cracking or chipping.

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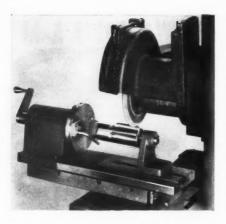


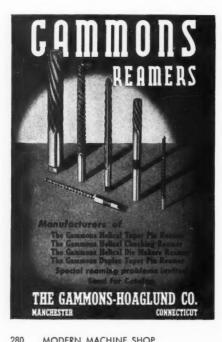
Illustration showing Tinker's Thread Grinder installed on a surface grinder

make of surface grinder, the Tinker's Thread Grinder shown in the accompanying illustration has been announced by the Tinker's Thread Grinder Co., 169 Granby Rd., South Hadley Falls, Mass. The unit is compact and light in weight,

measuring 6 inches high x 4 16 inches wide and weighing aproximately 26 pounds.

According to the manufacturer, the Tinker's Thread Grinder can be firmly held on the magnetic chuck of any surface grinder. A 4-inch sine bar on the end of the base is used for setting the helix angle of a thread. The tailstock center is adjustable to compensate for any error in work or if a taper on work is required. A hand crank on the opposite end of the unit is attached to a master lead screw which, in turn, is directly conected to a live ball bearing center faceplate. The lead screw operates through a bronze nut screwed onto the upright end of a stationary base. The work is rotated by the faceplate driving a dog attached to the work. As the lead screw is revolved by turning the hand crank, the form dressed on the wheel is ground in the work at the desired pitch.

A sheet steel housing fastened in place by two small screws protects the lead screw and bronze nut from any dust and foreign matter. The movable slide which holds the work between centers operates on ball bearing V-ways and can be locked against the upright end of the base held by the magnetic chuck. Straight circular work or special forms can then be ground. A straight shaft and cam at-







from end to end—side to side—inside and out. POBCO SELF-LUBRICATING BEARINGS are machined to micrometer exactness.



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USE WORLD'S FASTEST VISE

CUT COSTS
UP TO 75%
ON JIGS AND FIXTURES



You can stop the heavy expense and time losses common in the building of special jigs for drilling and light milling operations. Use the Heinrich "Grip-Master" as a base-structure. Built-in bosses and removable parallels permit easy attachment of bushing plates and locating jaws. You can speed up loading and unloading unbelievably, thanks to the large jaw openings of the "Grip-Master" and its revolutionary screwless feature.

## WRITE FOR FULL FACTS!

Ask your Mill Supply Dealer about the Heinrich "Grip-Master." If he does not yet have a stock, write for folder that fully illustrates and describes the money saving uses of this amazing tool.





NATIONAL MACHINE TOOL CO. DEPT. 117-K RACINE, WISCONSIN

## SIMPLE - FAST - ACCURATE LOCATING



### SIMPLE

Place instrument in spindle of boring mill (verti-cal or horizontal), drill press or jig borer.

### FAST

200 - 1000 r. p. m. Bring thumb nail to bear against centering bead until it runs true. machine and focus on work. Keep eye at least 4 inches from viewing aperture.

### ACCURATE

Locate cross lines on work to match lines in viewing aperture.

> Write for catalogue No. 12

## CENTER SCOPE PRODUCTS

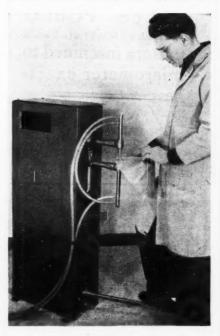
3829 San Fernando Rd., Glendale 4, Calif.

## Taylor Hall 10 KVA Spot Welder

tached in place of the regular lead screw and nut, with a spring between the mov-

able section and upright stationary base, can be used to back-off the chamfer on

The DoAll Co., DesPlaines, Ill., announces the Taylor Hall 10 KVA Spot Welder illustrated herewith. The machine



Taylor Hall 10 KVA Spot Welder

has an automatic electronic timing device (Raytheon) and magnetic contactor built in to provide for the making of excellent welds on a production basis, even in the hands of an unskilled operator.

Other features of the welder are its vertical-plane action which provides "true pressure," making tip alignment a simple matter and eliminating "tip skidding"; high-power-factor water-cooled transformer; completely adjustable horns and water-cooled electrode holders; adjustable stroke and treadle mechanism; and six-tap voltage selector. chine is supplied ready to operate

## CLEVELAND INDEXING HEAD

Regrind all straight or taper shank tools from 16 to 112 diameter in your own shop . . . on any surface grinder.

Rotates 360° in three planes on a common center.

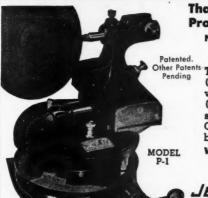
Automatic Indexing Gear for re-establishing concentricity.



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RINDERS & FIXTURES, Inc. 1241 W. 4th ST. . CLEVELAND 13, OHIO At Last!

## THE AUTOMATIC ANGLE TANGENT TO RADIUS DRESSER



That Eliminates the Breaks in the Profile at the Points of Tangency.

NO TEMPLATESI NO ROLLS REQUIRED! Three Simple Adjustments and It's Set-Up.

Other Patents The Jeon Dresser will dress a radius (within .0001") either concave or convex, with angles absolutely tangent (to a split second) on either or both sides of the arc, IN ONE CONTINU-OUS OPERATION. Also, any combination of angles or angles and arcs.

Write for Prices and Folder Describing
Its 20 Outstanding Features
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FOR FAST ACCURATE CUTTING OF FLAT SHEETS BY TEMPLATE OR TO A SCRIBED LINE-TUBE SLOTTING AND SHAPING

Sheets Flat mild %" Tough alloys %"

Tubing
Wall thickness to 1."
I.D. to 36" O.D.

## "NIBBLE YOUR COSTS"

Low initial investment. Eliminates expensive dies.

ASK FOR FREE BULLETIN "H"

**Manufactured By** 

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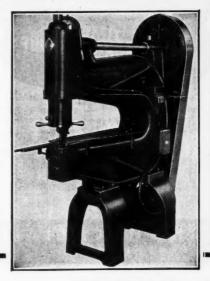
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TENNESSEE

Ploneer Manufacturers of Nibbling Machines

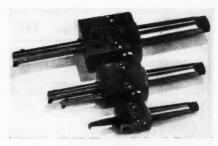


after connecting to 220-volt 60-cycle power and 110-volt 60-cycle timer sources and connecting electrode holders and transformer to water source a.d drain.

### "Mastur" Adjustable Precision Boring Head

Production of an adjustable precision boring head to be known as the "Mastur" is announced by The Maxwell Co., 325 Broadway, Bedford, Ohio. The head is adaptable for use on milling, drilling, and boring machines, as well as automatics, in performing rough and finish boring operations. It can be easily and quickly inserted and positioned accurately in a matter of seconds. The entire cutting strain is directed against solid metal.

The Mastur Boring Head is available in three sizes for cutting holes up to 15 inches in diameter. Each tool has a tool-steel adjusting head which is graduated in thousandths of an inch. The body of the head is graduated to provide vernier readings of 0.0002 inch. Cutters can be furnished with cemented carbide tips, and shanks of any size can be supplied upon request.

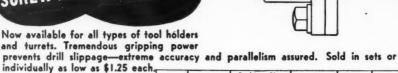


"Mastur" Adjustable Precision Boring Heads

The Mastur Boring Head is completely equipped for any type of operation. The tool block is dovetailed into the body, and all fitting surfaces are ground to assure precision fit and long life. Full offset in either direction is featured. The adjusting screw is hardened before threads are ground to assure accuracy.

The Mastur Boring Head No. 5 has a %-inch minimum capacity with a forged high speed steel bit and 7-inch capacity with alloy steel bar with square bit. Shanks available for use with this model are 4 and 5 Morse; 10 and 11 Brown &





Brown & Sharpe Set Prices

WRITE FOR FOLDER

Set No.	Holder Number	Bushing Size		Range of	No. of	Net Price
		Dia.	Length	Set in 64ths	Pieces	with Case
SB-103	00 AC 10-A	1/2	3/4	1s to 1s	17	\$20.00
58-105	11A 20 BA	3/0	18	16 to 18	25	\$31.00
SB-106	12B-14 22B	. 1	11/4	1/4 to 3/4	33	\$54.30

THE H. C. CLATFELTER COMPANY

# Deep Hole DRILLING

Send us prints of your parts requiring deep holes for an estimate on drilling only or furnishing parts complete.

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We are especially equipped to drill deep holes from 3/16 to 1½ inch diameters up to 12 feet deep.

## CONNER TOOL & CUTTER COMPANY

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## ZINC and ALUMINUM DIE CASTINGS

UP TO 2 LBS. IN SIZE

Let us furnish you with full information regarding our up to the minute service on die castings which are outstanding in quality and unsurpassed in accuracy. Write today.



WIREGRIP precision made Beit Hooks come with extra (patented) blue aligning cards—are held more rigid, assuring perfect dignment of hooks —less hook loss from handling— a better job when applied with any make lacing machine. 6 sizes.

STEELGRIP Flexible Lacing, applied with a hammer, clinches over and protects end of belt. Makes strong, flexible joints. Boxed with 2-place hinged rocker pins or can be obtained in long lengths for conveyor belt use.

## ARMSTRONG-BRAY & CO.

The Belt Lacing People

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DIE CASTING, INC.

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For Tool, Die, Pattern er Template leyeut on metal . . . Quick identification of stock and parts . . . Shows up in sharp relief—dries instantly—easily removed . . Write for circular,

\*Purple shipped unless otherwise specified

MICHIGAN CHROME & CHEMICAL COMPANY
6340 E. Jefferson Ave. • Detroit 7, Mich.

Sharpe; and 11/2-inch straight.

The Mastur Boring Head No. 6 has capacity ranging from ½ to 11 inches and utilizes a ½ or ¾-inch alloy steel bar with square bit. Shanks available for use with this model are 4 and 5 Morse; 10 and 11 Brown & Sharpe; and 1½-inch straight.

The Mastur Boring Head No. 7 has capacity range of from % to 15 inches and utilizes two alloy steel bars of ¾ and 1 inch in size. It can be used with shanks of 5 and 6 Morse; 11 and 12 Brown & Sharpe; and 2 inches straight.

## HPL Strip Expander

The HLP Manufacturing Co., 2013 E. 65th St., Cleveland 3, Ohio, has developed an expander for leather cup pack-



**HPL Strip Expander** 

ings produced in strip form. The expander is made of a specially heat-treated berryllium copper strip material that is said to be highly impervious to corrosion from brine solution, gasoline, alcohol, sea water, and many other solutions.

Designed for air-hydraulic, fluid sealing or other sealing problems, the HLP Strip Expander is arranged to maintain constant contact between the packing seal lip and cylinder wall on all pneumatic and hydraulic equipment. According to the manufacturer, the expander does not increase friction or wear on the packings since the unit merely exerts enough pressure to maintain constant contact between the packing and cylinder wall.

The HLP Strip Expander is designed



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# Outstanding FOR TAPPING !

When tapping and reaming jobs come through with oversize or bell-mouthed holes, it is a simple matter to correct the difficulty. Change over to a Ziegler Floating Holder which automatically compensates for inaccuracies in set-up, even though they amount to as much as 1/32" radius or 1/16" diameter.

Take a few minutes to figure up what your rejects are costing you each month and you will appreciate the economy of equipping your machines with Ziegler Holders. They not only shorten set-up time but also speed up production and make tools last longer.

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W. M. Ziegler Tool Co.

1928 TWELFTH ST. DETROIT 16, MICH.



# "CONE-LOK" JIGS

- MECHANICAL SIMPLICITY
  - · ADAPTABILITY
- RUGGED CONSTRUCTION
  - . CHIP PROTECTION
  - . SEALED LUBRICANT
  - MAXIMUM SAFETY



The Woodworth "CONE-LOK" jig utilizes the full braking 

power of its perfectly mated male and female cones.

ACCURACY YOU CAN TRUST

★ CATALOG AND FULL SCALE TEMPLATES UPON REQUEST ★

# WOODWORTH

N. A. WOODWORTH CO., SALES DIVISION • 1300 E. NINE MILE RD., DETROIT 20, MICH.

to fit any cup diameter 2 inches and over. To install, a suitable length of the expander is merely cut off and inserted between the clamping plate and packing seal in order to obtain the required pressure on packing lip for installation.

### Preis Rotary Work Table

A 5-inch rotary work table for engraving, profiling, graduating, milling, and drilling on circular name plates, dials, round dies, or any object requiring circular or semi-circular cutting is now being offered by the H. P. Preis Engraving Machine Co., 157 Summit St., Newark 4, N. J. Although primarily designed for use on Preis pantographic engravers, its compactness and low build make the unit adaptable to virtually any engraving machine. It can also be used to advantage on small production milling and drilling machines where, it is claimed, layout work can be greatly reduced on many types of jobs.

The outer rim of the turntable is marked in degrees and numbered at every tenth degree. Each degree is notched for quick and accurate division by engaging the index unit. This unit can be disen-



Preis Rotary Work Table

gaged for free turning, using a cam-lock to secure the turntable.

The top and bottom surfaces of the table are ground accurately parallel to assure an even depth of engraving or other class of machining over the entire surface. The working surface is provided with four T-slots for ¼-inch bolts, and a %-inch diameter hole for centering the work with a stud. The overall height of the table is 1% inches.



# **ARTUS PLASTIC SHIM**



FEELER GAUGE STOCK

The COLOR tells the THICKNESS

Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting. 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors—12 thicknesses (.001-.030). Bound together. \$4.25.

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Lower Production Costs and Provide Greater Ease of Assembly



### Check These Advantages

- ✓ Eliminate skilled labor in key-seat cutting and key-fitting operations.
- V Flat key bottom and starting radius on the edges simplify assembly.
- Key reaches deep into shaft and is firmly imbedded, enabling it to withstand greater strain.
- √ Greater resistance to shaft fracture due to shape of key seat and permanent key fit.

Made in American standard sizes and Whitney standard sizes for special application.

Available from Whitney Distributors throughout the country. Or write:

WHITNEY CHAIN & MFG. CO. HARTFORD 2, CONN.

# GRINDING WHEEL DRESSERS

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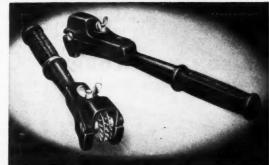
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"They sure do a great job!"

CHAMPIONS pay off in top performance and tool economy. The patented-design assembly cap adds safety. Spindle bearings guide the cutters preventing wobbling and wear. Handle and cap last indefinitely, and mounting either Star or Corrugated Cutters, will give peak performance on any mechanical straight-face dressing job in the shop. For your best tool buy, always choose from the line of CHAMPIONS.





The WESTERN Tool and Manufacturing Co.Inc.

STOCKED BY LEADING INDUSTRIAL SUPPLY DISTRIBUTORS FROM COAST TO COAST.



The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.



MADISON-KIPP CORP. 208 Waubesa St., Madison, Wis., U.S. A.



### Corlett-Turner Model G3 Grinder

An offhand or freehand grinder featuring individual arbor-mounted wheels and triple-speed selection is announced by the Corlett-Turner Co., 1001 S. Kostner Ave., Chicago 24, Ill. Designated as the Model G3, the machine is especially designed for small tool grinding jobs. Each grinding wheel is mounted on a ground tapered arbor which fits into a hardened and ground socket in the spindle. The mounted wheel can be changed in a matter of seconds without the use of any tool. A slight wrist motion on the end bells of the grinder head releases the wheel arbor and

the reverse motion instantly locks it in place.

The Corlett-Turner Model G3 Grinder incorporates a 3 speed pulley arrangement which permits the selection of the proper spindle speed for any vitrified wheel from 1 to 4 inches in diameter. A simple hand lever allows for quick adjustment of the belt to the required position. Belts can be quickly interchanged without removing the spindle or the bearings.



Corlett-Turner Model G3 Grinder

In addition to its M

primary use as a grinder, the Model G3 is said to be especially adaptable for deburring, polishing, buffing, and other operations requiring the use of a high speed spindle. Besides a selection of vitrified wheels mounted independently on tapered arbors, a collet type arbor is included as standard equipment. The collet has a capacity of ¼ inch. All types of mounted wheels and tools such as rotary files, drills, countersinks, and so on, can be used on the high speed precision spindle.

The lighting fixture provided on the Model G3 is equipped with safety glass and is custom-built to afford a maximum amount of light in the working area. The steel tubing arm is said to keep the light rigidly in place, however, ball type knuckles at the base and head of the tube permit it to be easily moved to any

# STANDARD STEEL SPECIALTIES

### MACHINE KEYS

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We can supply a complete line of finished machine keys including gib head and taper keys, rod keys, round end keys, etc.

### WOODRUFF KEYS

Complete stock of standard keys on hand for prompt shipment. Made from open hearth or alloy steel.

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Available in sizes 7/0 through 10 and lengths from % inch to 6 inches. Others made to specification.

### MACHINE RACK

Can furnish rack from almost any size blank and pitch as well as length to form continuous sections.

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# STANDARD STEEL SPECIALTY COMPANY

BEAVER FALLS

PENNSYLVANIA

PLANTS BEAVER FALLS PA . HAMMOND





position desired. The tool rest is also instantly adjustable.

The machine is precision built throughout. The spindle, which is hardened and ground, is powered by a ½ h.p. motor, and the entire unit is ruggedly constructed.

# Matco Universal Dividing Collet Head

A universal dividing collet head for both grinding and milling operations is now being manufactured by the Matco Tool Co., 2834 W. Lake St., Chicago 12, Ill. Features of the unit include a sturdy graduated base, Torrington precision needle bearings, and hardened and

ground index plate.

Measuring 5% inches high, the Matco Universal Dividing Collet Head includes felt seals for dust protection and is designed to accommodate ground thread collets up to 1-inch capacity. Applications of the unit include angle, flat, and hexagon milling and grinding. With attachments, the head can be used in performing collet grinding operations on external grinders, for sharpening plain and side



Matco Universal Dividing Collet Head

mills and end teeth on end mills. Moreover, the collet head can be used for diamond dressing radii and angles on grinding wheels.



### Porter-Cable "C-6" Belt Grinder and Polisher

Especially designed for the grinding and polishing of contours, maintaining a sharp, fully-machined pattern, the Porter-Cable "C-6" Belt Grinder and Polisher illustrated herewith has been brought out by the Porter-Cable Machine Co., 300-7 Wolf St., Syracuse 8, N. Y. In the machine, a flexed abrasive belt approaches and leaves a formed contact roll at a slight angle. The abrasive belt



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Porter-Cable "C-6" Belt Grinder and Polisher

"drapes" itself into the pattern on the roll and grinds and polishes the pattern quickly. The pattern is turned into the contact roll, which is made of sisal and latex, and is said to hold a pattern indefinitely yet is slightly resilient for smooth, fast grinding and polishing.

The Porter-Cable C-6 Belt Grinder and Polisher occupies a floor space of 26 x 38 inches and is designed to accommodate a 148-inch abrasive belt. Its contact roll is not a driving force but an idler; thus, heat and motor and shaft vibration are said to be eliminated. The surface speed of the abrasive belt is claimed to remain constant regardless of the diameter of the contact roll.





Cunningham Tagging Outfit

A metal tagging and tag embossing outfit designed primarily to provide a permanent and efficient method of identifying billets during storage in yards prior to the rolling operation is announced by the M. E. Cunningham Co., 158 Carson St., Pittsburgh 19, Pa. The outfit is also said to have numerous warehousing and industrial applications wherever ferrous, non-ferrous, or wooden products require permanent identification.

In operation, interchangeable embossing type can be quickly set up in the embossing unit. After embossing with a light hammer blow, the tag is placed in a fixture which bends it to fit over the hammer face and into the hammer clamps provided, at the same time punching a special heat-treated nail through the tag. The hammer used with the tagging outfit is a regular 3-lb. Safety Engineer's style tool. By swinging the ham

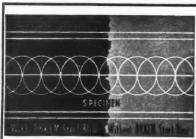
mer in the customary manner, the nail can be driven into the steel billet, permanently attaching the tag for quick, easy identification.

# Porter-Cable Model DBS Double Belt Bench Grinder

The Porter - Cable Machine Co., 300-7 Wolf St., Syracuse 8, N. Y., announces the addition to its line of precision abrasive belt grinders of a double belt bench grinder designated as the Model DBS. A heavy duty drive shaft mounts two sturdy 7-inch diameter x 2½-inch wide resil-

diameter x 2½-inch wide resilient contact rolls located side by side and only inches apart. Each contact roll is aligned with an idler adjustable for abrasive belt tension, tracking, and lining up with the contact roll. This setup provides for the use of two endless metal cutting abrasive belts 2½ inches wide x 60 inches circumference.

The result is a two-station grinder; one station can be fitted with a coarse abrasive belt for rough grinding, the other with a fine grit belt for finishing. Since both stations are very close together, the operator is not required to move back and forth from one side of the unit to the other to perform the different operations. In addition, the resilient roll receives little, if any, wear. All work is done by the millions of sharp cutting abrasive grains almost entirely exposed, with no binder or filler to interfere with its full cutting capacity. Abrasive belt changes when required can be accomplished in a



# DYKEM STEEL BLUE

Stops Losses in Making Dies and Templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

### THE DYKEM COMPANY

2301F NORTH 11th ST.

ST. LOUIS, MO.

(In Canada: 2466 Dundas St., West, Toronto, Ont.)

Porter-Cable Model DBS Double Belt Bench Grinder

few seconds and, since the circumference of the belt is unusually great, heat is dissipated.

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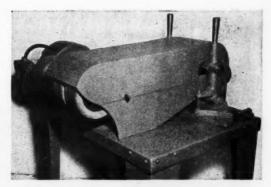
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The Model DBS equipped with a 1 h.p. motor provides the abrasive belt a cutting speed of 5,200 surface feet per minute. A dust guard designed so that dust follows naturally to an outlet in the rear of the unit is furnished as standard equipment. Accessory items available

include an 8-inch diameter contact roll, 29-inch high or 12-inch low leg assemblies, and a wire brush attachment.

Ideal for working all types of metals, the Model DBS is said to perform equally well on such operations as burring gears, generating radii, weld grinding, removing flash, flat and edge work, and all types of clean-up and polishing operations. The entire unit is ruggedly constructed and is said to operate free of vibration.



# Cross Power Index Milling Machines

Two power index type milling machines for machining exhaust and intake manifolds have been dveloped by The Cross Co., Detroit, Mich. The machines are designed to mill the stud clearances and the backs of the mounting flanges to provide uniform contact surfaces when nuts and washers are assembled, and are said to be capable of producing

# WHITNEY- JENSEN PRODUCTS

# COMBINATION BENDING BRAKES

# ROLLER BEARING

Working Lenths 4' - 5' - 6' - 8' - 10'

Capacities 16 - 14 - 12 ga.





Capacity—1/8" Mild Steel Length of Blade—31/2" Weight—11 lbs. Length Overall—261/2"

WHITNEY METAL TOOL COMPANY



Write for New Catalog.



93 pieces net per hour. Hardened and ground steel ways are provided throughout, and all motions, except for work clamping, are controlled by push buttons.

Each machine has three stations. The first station is for loading and unloading

the work. The second station is for milling the backs of the flanges, while the third station is used for form milling the stud clearances. All operations are performed simultaneously so that one workpiece is completed with each index.

The machines are designed to utilize Cross standard machine elements. Station Two utilizes a Cross No. 101 vertical column. The horizontal head used at Station

Three is a Cross No. 26 hydraulic way-type feed unit. The power driven 36-inch index table is also a Cross standard unit.

# "OLIVER" BELT SURFACING AND POLISHING MACHINE

for finishing surfaces of plates, ornamental metal, metal mouldings, etc.

The three units — each self-contained — are adjustable to handle work of any practicable size. Rubber-faced, turned aluminum pulleys. Ball bearing, noiseless direct motor drive.

Write for Bulletin No. 183M

# OLIVER MACHINERY CO.

Grand Rapids 2, Michigan

# Van Norman No. 16 Ram Type Milling Machine

The Van Norman Co., Springfield 7, Mass., announces a ram type milling machine which is especially applicable for the toolroom, pattern shop, die and mold shop, experimental laboratory, repair shop, and general purpose milling. Designated as the Model No. 16, the machine features an adjustable cutter head and movable ram which permits horizontal and vertical as well as angular milling with standard milling cutters and conventional milling practices. Since most work can be carried through to completion without change in setups, the miller reduces idle machine and operator time. The movable ram in combination with the saddle and knee adjustment increases the versatility and work range of the miller.

Among the outstanding features incorporated in the Van Norman No. 16 Ram Type Milling Machine are the built-in controls mounted on the left side of the column. By merely moving a single lever, the operator can start the spindle, feed, and coolant or any combination thereof. The same lever is used to reverse the spindle, and so on. A "start-stop" switch is located on the front of the knee, thus permitting the operator to start and stop

the machine without going around to the side controls. The machine is ruggedly constructed throughout with a heavy box-type column and large knee, saddle and table assembly.

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Power feed is provided for longitudinal table travel. Table feeds and spindle speeds are controlled by quick-change levers which provide for nine feeds ranging from 0.6 to 16 inches per minute. Nine spindle speeds of from 95 to 2,000 r.p.m. can be easily selected by two levers. Large handwheels are provided to



Van Norman No. 16 Ram Type Milling Machine

afford cross feed and vertical feed as well as table adjustments. Dials are graduated in thousandths of an inch and are large for easy visibility and adjustment.

Other features include precision ground feed screws; hardened alloy steel gears with large tooth area; multi-splined hardened alloy steel shafts; anti-friction bearings throughout; and one-shot metered lubrication. The heavy ram has dovetails ways, thus providing for rigid support to the column. A new type ram binder solidly locks the ram to the column.

Specifications of the Van Norman No. 16 Miller are as follows: table size, 37 x

# BUTTERFIELD



BUTTERFIELD TAPS can be supplied in four different grades as follows:

- 1. Carbon Steel Cut-Thread Taps.
- 2. High-Speed Steel Cut-Thread Taps.
- 3. High-Speed Steel Commercial Ground-Thread Taps.
- 4. High-Speed Steel Precision Ground-Thread Taps.

# UNION TWIST DRILL CO. BUTTERFIELD DIVISION

Factories: Dorby Line, Vermont, U.S.A. Athol, Mass.; Mansfield, Mass.; Rock Island, Quebec, Can.

### STORES

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91/2 inches; table travel (power), 18 inches; saddle cross feed (hand), inches; and knee vertical feed (hand), 17 inches.

### Walker Improved Permanent Chuck

Said to weigh 45 lb. less than the original design, with the height reduced to 31 inches to allow more head room than heretofore obtained, an improved permanent chuck measuring 6 x 18 inches has

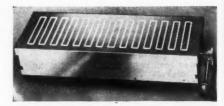
# THOR STAMPS Last Longer



. . . because they're made of a special, correctly - heated alloy steel. Central striking point assures uniform marking. Thumb side marking assures easy use.

You get more mark per dollar with THOR STAMPS. Write for catalog and prices.

The Pittsburgh Stamp Co., Inc. 812 CANAL ST. PITTSBURGH, PA.



Walker Improved Permanent Chuck

been developed by the O. S. Walker Co., Inc., Worcester, Mass. Moreover, the holding force of the chuck is said to have been increased by 5 per cent.

Similar improvements have been made in the 4 x 8 and 5 x 10-inch sizes of the Walker Permanent Chuck.

# Willey's 606 Universal Cutting Grade

A universal grade of Willey's Metal which may be used for machining all types of steel has been placed on the market by the Willey's Carbide Tool Co., 1340 W. Vernor Highway, Detroit 1, Mich. Designated as 606, the metal can be furnished in standard tools, special tools, or blanks for those desiring to make their own tools. It can be used at low speeds with heavy feeds, as well as for light finishing cuts.

# New Method Annular Marker

A stamping device for annular marking which utilizes a combination of a solid stamp and interchangeable type has been developed by New Method Steel Stamps, Inc., 149 Jos. Campau, Detroit 7, Mich.



(FROM 1/4" to 1/2"-FROM \$1.71 TO \$3.75)

HIGH SPEED STRAIGHT SHANK DRILLS 9-Inch Flute

# Eastern Tool Supply Co., Inc.

176 Grand St., New York 9, N. Y.

# FREE COPY

MACHINE SHOP EQUIP-MENT—125 page fully illustrated catalog describes a large variety of drills, reamers, cutvises, etc.

With the marker, parts like gears, bushings and sleeves can be stamped around radii with such "standard" information as the part number and/or a trade mark, together with additional "variable" data such as a heat treat code, the date, or a batch number, all in the same marking operation. In addition to lending itself to fast, accurate hand stamping, the marker also has a press mounting adapter which permits it to be used on practically all types of presses (including manual presses) for machine stamping.

The New Method Annular Marker consists of a mounting adapter and a bushing stamp carrying the "standard" information and also mortised to take interchangeable characters for the "variable" data, all held together by set screws. The set screws that hold the bushing stamp in place engage a V-groove in the adaptor arbor. Each interchangeable stamp has a flat ground on one side. The set screws bear on these flats, thus ensuring accurate radial alignment no matter what size bushing is used for the solid stamp.

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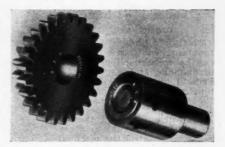
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Both the annular solid stamp and the adapter are of hardened tool steel, ground to close tolerances. All insert stamps are hardened and then ground to a standard



New Method Annular Marker

size and length so that they can be changed and accurately aligned on any stamps having varied radii. Insert stamps can be changed without removing the annular solid stamp from the press when the device is being used for machine marking.

A wide range of sizes of solid stamps can be used on the same adapter. Moreover, the design of the New Method Annular Marker is such that variations to suit individual requirements can be readily made.

# CRATEX RUBBERIZED ABRASIVES



# WHEELS POINTS

Assortment No. 774 \$2.50 A Big Value

This is a standard assortment to acquaint Industrial plants, home workshops, hobby crafters, etc., with CRATEX products — rubberized abrasive wheels for fine grinding and polishing. CRATEX products are especially useful on hand power tools.

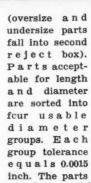
At Tool and Supply Dealers

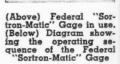
CRATEX MANUFACTURING CO., 97 Natoma St., San Francisco, Calif.

# Federal "Sortronmatic" Gage

Thirty-six hundred plastic fountain pen barrels per hour can be inspected for accuracy of diameter and length on the Federal "Sortron-Matic" Gage illustrated herewith, product of the Federal Products Corp., 1144 Eddy St., Providence, R. I. An electronic system is used to make the actual measurement and control the mechanical devices which sort the barrels into six acceptable size categories. Oversize and undersize pieces are automatically rejected. The acceptable size categories are said to vary by only 0.0015 inch.

The operating sequence of the Federal Sortron-Matic Gage is diagrammatically shown in the accompanying illustration. As the pen barrels pass through the gage at the rate of one every second, they are inspected for (1) acceptance or rejection for length (oversize and undersize parts fall into reject tote box while acceptable parts continue through the gage); (2) acceptance or rejection for diameter

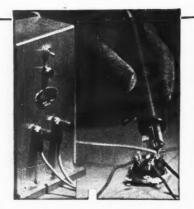




are also counted. Eight separate counts are taken—four acceptable categories and four reject groups.

When any size group reaches 1,000, the gage automatically cuts off and a reciprocating arm picks up the parts at the loading table and swings them through inspection to the disposal position. As one part is gaged and ejected into disposal, the next pen barrel enters the mechanism. Although two dimensions are examined, the actual gaging stroke is continuous and uninterrupted. A small electric motor actuates the feed arm. The parts are dropped by gravity through the solenoid-operated trap doors into the proper size boxes.

According to the manufacturer, the accuracy of the measurement afforded by the Federal Sortron-Matic Gage is uninfluenced by normal atmospheric and electrical fluctuations. Each time a part is gaged, an accurate electronic size impulse travels from the comparator to the electronic classifier where it is inter-



# FOR FASTER, SAFER SOLDERING

The Luma resistance method of soldering is the accepted way for small shops requiring single operation to large plants with many types of operations. Write for complete information about this remarkable tool.

LUMA ELECTRIC EQUIPMENT CO.
P. O. Box 132-M.S. Toledo 1, Ohio





preted. Anywhere from 4 to 14 size categories can be controlled by the classifier, depending upon the job requirements. The classified size impulse can be used to actuate trap doors, counters, or other electrical devices. Similar gages are also available for inspecting piston pins, wafer parts, bearing balls, plain and tapered rolls, lengths, diameters, and combinations of dimensions.

# Matthews Special Purpose Marking Machine

A special purpose marking machine for imprinting the circumferences of small cylindrical parts, thick or thin-



Matthews Special Purpose Marking Machine

walled, has been designed by Jas. H. Matthews & Co., 3944 Forbes St., Pittsburgh 13, Pa. The machine is operated pneumatically, fed by hand, and controlled by a four-way foot lever. Depending upon the feeding skill of the operator, the production speed of the machine is from 5% to 1,500 parts per hour. The size of the machine is determined by the type of job to be done. The unit illustrated is designed to mark brass electric screw bases.

Operation of the machine is described as simple. The part to be marked is placed over a mandrel which is geared to a rack under the steel marking die, thus enabling the part to move at the same speed as the marking die. The footoperated air valve controls the air cylinder, pushing the plunger to the full limit of the stroke. Removal of the part completes the marking operation.

The machine is mounted on a heavy steel plate base and is equipped with an attachment which controls the depth of the mark to allow for differences in the thickness of the material being used. Air cylinders can be supplied in several different sizes to meet specific requirements. A reducing valve and air gage are necessary since the machine should be operated with only 40 to 50 lb. pressure.

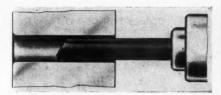
# Carboloy Standard Carbide Boring Bar

A boring bar made of solid Carboloy cemented carbide, making possible the precision boring of holes having a length to diameter ratio as high as 8 to 1, is now available from the Carboloy Co., Inc., 11149 E. Eight Mile Rd., Detroit 32, Mich. The baris offered in 8 sizes and in 2 styles.

The boring of automotive and aircraft valve guides, piston wrist pin holes, and so on, are among applications for the Carboloy Standard Carbide Boring Bar which is said to be suitable for the precision boring of steels; cast iron (including the fine grain cast irons); bronzes; brasses; and aluminum alloys.

The two types of carbide boring bar are (1) a solid carbide bar with a carbide boring tool brazed into a recess in one end of the bar and (2) a solid carbide bar containing a steel insert at one end of the bar in which the carbide boring tool is held and adjusted with set screws. The first type of bar is available in only one size—¼ to %-inch boring diameter; 3½ inches long; 0.218 inch in diameter; and utilizing a rectangular blank measur-





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Carboloy Standard Carbide Boring Bar with Brazed Tool

ing 3 x 1/8 x 3 inch for the cutting tool. The tool can be furnished in grades suitable for both steel cutting and for the boring of cast iron and other materials. The bar is furnished either finish ground and ready for use or in the unground condition as desired.

The solid Carboloy boring bar with steel insert is available in a range of 7 sizes. The range of boring diameter is from 1/4 to 1/8 inch for the 0.218-inch diameter 31/2-inch long bar by increments of 1/3 inch up to the largest bar which has a boring range diameter of 1 inch and is 111/2 inches long and 0.937 inch in diameter. Either unground or ground bars are furnished as standard, without tool.

Solid Carboloy boring tools are for use with the steel insert carbide boring bars are furnished finish ground and ready to use in grades suitable for both steel cutting and for the boring of cast iron and other materials. These tools range in size from those of 0.0932 inch diameter and a inch long for use with the smallest standard bar to those tools of 0.1870 inch diameter and 1 inch long for use with the largest standard bar.

Carboloy Standard Carbide Boring Bar with Steel Insert in One End



# CHERR aids to precision — production

Control the Job From Start to Finish with the

WILDER PROJECTOR

Throws a magnified shadow image of the part under inspection against on enlarged drawing

of part. Magnifications available, 10x to 200x. Horizontal work table for flat work. Center support and micrometer cross slides for checking forming tools, screw threads, hobs, etc. Eliminates all errors due to ' May be speedily operated, with little or no experience. Prevents costly errors and insures initial correctness from the start of a production run. THIS COMPARATOR can be equipped with a new circular type of Surface Illumingtor.

# THE SCHERR MAGNI-RAY

New hori-

zontal type

for pro-

duction inspection

just out.

An invaluable inspection tool, because it magnifies the work under inspection, floodlights it as well, and gives the immense advantage of "twoeye seeing." No wonder thousands of Magni-Rays are serving in large inspection departments, and other thousands on precision machines or critical toolroom operations. The lens is ground by experts for true magnifica-

tion. Heavy base permits swinging lens to any position any height to 14 in. Three types—Model A, 3" lens, 11/2x plus. Model B, 3x plus. Model C, 5" lens, 11/2x plus.

# GAERTNER TOOLMAKERS' MICROSCOPE

For rapid precision checking of critical dimensions, angles, contours, etc. A scientific instrument with the rugged strength of a manufacturing tool. Valuable in both tool room and inspection department and absolutely required for thread inspection. You can see that last ten-thousandth with the Gaertner. You can instantly spot the slightest de-

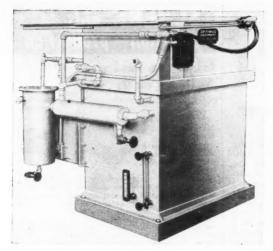


viation from correct angle. All eyes see it alike, toono arguments. Any toolmaker can use it. Wide range of templets for use with the templet ocular head.

Write for full details on these tools, and for the Scherr Small Tool Catalog.

CO., Inc.

198-A Lafayette St. New York 12, N. Y MODERN MACHINE SHOP



Optimus Type OP-1-48 Vapor-Spray Degreaser

### Optimus Type OP-1-48 Vapor-Spray Degreaser

Designed for use with trichlorethylene. a vapor-spray metal parts degreaser designated as the Type OP-1-48 has been introduced by the Optimus Equipment Co., 123 Water St., Matawan, N. J. The unit is fabricated of 3-inch steel plate and reinforced by structural members and allelectrically welded.

The body of the unit and internal auxiliaries are hot-dip galvanized after fabrication. Heating and cooling coils, which are designed for maximum efficiency in the complete recovery of solvent, are readily removable for cleaning and maintenance. The unit acts as a still to recover the contaminated solvent, thereby providing a continuous supply of power distilled solvent for the spray as well as for the vapor phase.

The Type OP-1-48 degreaser can be used for the degreasing of metal parts prior to further finishing operations in the process of manufacture or can be used for metal parts degreasing in maintenance operations. Chips and insoluble impurities and buffing compounds that have been worked into sharp corners or crevices can be efficiently and quickly removed by the use of a spray of the solvent directed at the work. A hand spray line made of special woven metal hose is supplied as a special feature for this purpose. Heat to vaporize the solv-

ent may be supplied by either steam, gas, or electricity. Automatic vapor and temperature controls can be provided as

optional accessories.

The degreaser has a work clearance of 45 inches long x 27 inches wide. The unit measures approximately 48 inches wide x 48 inches long x 60 inches high overall and has a capacity for handling 200 lb. of steel per hour.

# U. S. Adjustable Multiple Spindle Universal Joint Drill Head

An adjustable multiple spindle universal joint drill head available with two to ten spindles, each capable of drilling a 1/2-inch diameter hole in cast iron, is now being marketed by the U.S. Drill Head Co., 616 Burns St., Cincinnati 4,



-tilustrated

# PALMGREN ROTARY TABLES

Turn your Drill Press into vertical Miller. No. 83 Rotary Table has 8" circular table, dual cross feed 21/4" each side of center or 41/4" overall. Rotary feed calibrated in degrees, cross feed in thousandths. No. 83 Table—Dual cross feed and rotary

\$49.50 feed No. 82 Table-Dual cross feed only. 39.75 Write for Circular 109 - IMMEDIATE DELIVERY

CAGO TOOL AND ENGINEERING CO. 8399 South Chicago Ave., Chicago 17, III. Write for Circular 109 Phone Saginaw 9675

Standard spindles are furnished with No. 1 Morse taper. Vertical adjust-ment, as well as Erickson precision chucks and Scully-Jones single-purpose chucks, can be furnished on order.

The spindles are mounted in "Oilite" bushings, and heavy duty ball thrust bearings are provided for tool thrust. The spindles can also be furnished with No. 2 Morse taper, thus increasing the capacity of the spindles to %-inch in cast iron. At the same time, larger universal joints are furnished which are capable of accommodating this additional load.

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The spindles with No. 1 Morse taper can be adjusted to any hole pattern within a 10-inch diameter circle, with minimum center distance between any two spindles of %-inch. The drilling area with No. 2 Morse taper spindles is 9% inches, and the minimum center distance between two spindles is 1% inches.

The universal joints are of heavy duty construction and are provided with a Neoprene hermetically-sealed cover and lubricated for life. The joints can be removed in a matter of seconds by an operator without the use of tools of any kind. Both the upper and lower ends of the joints have a hexagonal broached hole which slips overthe male spline ends of the driver and spindle. The joints are held apart by a compression spring inside the sleeve and sliding shaft. This arrangement not only allows replacement of joints by an inexperiencmechanic. but also permits the joints to be removed and the head used



than originally furnished. All rotating parts in the gear chamber are mounted on ball bearings. All shafts and gears are made of high carbon steel, properly heat treated; gears are of the stub tooth, helical type. Head castings are made of high-grade aluminum alloy.

A slip spindle plate can be furnished. This plate, which is designed for mounting on the bottom of the head, can be bored for one or more pieces and, with the use of the slip spindle assembly (the spindle is encased in a steel quill, making it self-contained), has the advantages of a fixed center head. With the use



U. S. Adjustable Mul-

tiple Spindle Univer-

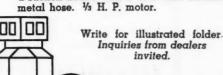
sal Joint Drill Head

# DUST COLLECTOR

for Surface Grinders, etc.

The Type S is an inexpensive dust collector designed for machines which are used intermittently and which cannot readily be connected to an exhaust system. Easily moved around shop.

The front of the box is a hinged door for easy inspection. Capacity-325 CFM at 31/4" W. G. Static suction of 2" W. G. in a suction nozzle with 4' of 3" dia. flexible







**COLONIAL BLOW** 

17 FRANCIS AVE. HARTFORD, CONN. of the slip spindle plate, the universal joints can be changed from one setup to another in a very few minutes.

# Van Keuren %-Inch Diameter Microgage

The Van Keuren Co., 176 Waltham St., Watertown, Mass., announces that its Microgage (precision gage block of round cross section for set-up work and inspection in the shop) is now being made % inch in diameter instead of 1½ inch in dia-



# PUNCHES and DIES

Large range of round, square, flat, and oval sizes are carried in stock for immediate shipment. Special Tools Made To Order.

Circular Available.

T. H. Lewthwalte Mach. Co. 317 East 47th St., New York 17





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Van Keuren %-Inch Diameter Microgage Set

meter. This increase in diameter is said to result in a gage which has a 60 per cent more wearing service and wringing quality. It is also said to provide needed extra rigidity in the 2, 3, 4, and 6-inch blocks, which enables them to be produced with maximum accuracy of size and squareness.

The Van Keuren %-Inch Diameter Microgage is available in 5, 7, 16, and 35-block sets. The 35-block set providing combinations in ten thousandths from 0.300 to over 14 inches is shown in the accompanying illustration.

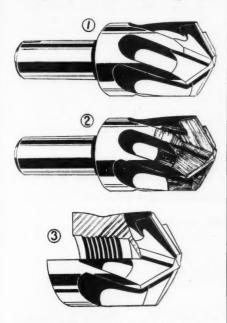
### Severence Standard Chatterless Countersinks

Severance Tool Industries Inc., 726 Iowa St., Saginaw, Mich., announces the expansion of its line of standard chatterless countersinks in three different re-



spects. First, chatterless countersinks having 60-deg. angles with the center line are now made standard in nine sizes up to 1 inch in diameter. Other standard angles in the standard series are 30, 41, and 45-deg. with the center line in sizes up to 2 inches in diameter.

Secondly, Severance Standard Chatterless Countersinks are now available in cemented carbide in sizes up to 1½ inches in diameter and in the same standard angles as for high speed countersinks. Thirdly, chatterless countersings with



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Severance Standard Chatterless Countersink with (1) 60-deg. cutting edges, (2) carbide cutting edges, and (3) threaded body

threaded bodies have been added in sizes 1 inch in diameter and larger. Body dimensions are the same as for the standard chatterless countersinks having integral shanks. The threaded body countersinks can be mounted directly to the user's adapters or to the tapered shank and straight shank adapters or arbors offered in various sizes by the company.

Severance Standard Chatterless Countersinks feature unique shear-cutting teeth, staggered both as to spacing and shear-angle which is said to effectively preclude chatter and result in the fast cutting of seats with ideal finish.



# Colonial Type V Dust Collector

Product of the Colonial Blower Co., 17 Francis Ave., Hartford, Conn., the Colonial Type V Dust Collector illustrated



Colonial Type V Dust Collector

herewith is a completely self-contained unit with hinged doors for the easy cleaning or changing of filters. Two handles are provided for the quick and easy opening of the doors.

Designed to handle dust and lint resulting from buffing and polishing operations, the unit is sturdily built of heavy gauge steel on an angle iron framing and is available in four sizes with capacities of 400, 800, 1,200, and 1,600 c.f.m. With the collector, heat loss is said to be reduced to a minimum since the cleaned air is returned to the room. Depending on the size, the unit occupies a floor space of  $24 \times 22$  to  $24 \times 42$  inches and weighs from 200 to 325 pounds.

# Wagner Motor Repair Parts Kit

The Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo., announces the availability of a handy motor repair parts kit in two types; namely, the small M-1 for service men to carry with them, and the large M-2 for convenience and economy of stocking replacement parts in the shop.

The M-1 kit is of heavy fiber and measures 11% inches long x 6 inches wide x 1% inches deep. It contains a variety of 61 replacement parts most commonly needed in repairing appliance type motors up to and including ½ h.p., including sleeve bearings, brushes, and switches. The shipping weight is 3 pounds.

The M-2 drawer-type kit is of sheet

# CUT DOWN COSTLY BLADE BREAKAGE -STEP-UP BAND-SAW PRODUCTION! PADDOCK BALL-BEARING BAND SAW GUIDES hold the working portions of your saw-blades as if they were in a frame-free from friction. Inter-Changeable ball-bearing wheels turning with the blade give smooth-sailing support. Modernize old equipment—specify PADDOCK GUIDES on your new machines. Write today for circular and prices. SOLD ON 10 DAY FREE TRIAL. PADDOCK TOOL COMPANY 1418 Walnut Street Kansas City 6, Missouri Guide Makers Since 1920 PADLOCK BALL-BEARING BAND SAW GUIDES

308

steel and measures 24½ inches long x 13 inches wide x 4 inches deep. It contains an assortment of almost 700 fast-moving replacement parts for repulsion-start induction and capacitor-start motors up to and including 3 h.p. The shipping weight of the kit is 46 pounds. Each type of kit is supplied complete with a list of contents printed on the inside cover in order to simplify reordering.

# Ideal 1-B Threading Toolholder

The Ideal 1-B Threading Toolholder announced by Guarantee Tool Co., Inc., 96 Maple St., West Orange, N. J., is claimed to reduce to a minimum the operating time required to cut a thread in a lathe. Made to hold a single point cutting tool, the holder is so constructed that the cutting tool retracts in a horizontal plane away from the work when the pressure is too great for efficient cutting, thus preventing breakage of the tool point or damage to the workpiece. As a result of this horizontal movement of the toolholder element, minimum clearance is required at the cutting point of the tool, thus providing for maximum support to the cutting surface. It is further claimed by

the manufacturer that absence of side sway and a substantial support for the cutting tool permit the taking of unusually heavy cuts, prevent sagging of the



Ideal 1-B Threading Toolholder

tool, inhibit the formation of build-up on the tool point, and assure unilorm cutting action.

An outstanding feature of the Ideal 1-B Threading Toolholder is an adjustment which permits increasing or decreasing the horizontal pressure while the tool is cutting. The shank of the toolholder is ½ inch wide x 1 inch high x 5 inches long. The maximum height of the holder is 2 inches and the overall length is 6 inches. The shank and side guards are surface hardened and treated to prevent rusting.

# DIE CUSHIONS THAT MODERNIZE YOUR DIE CONSTRUCTION AND DESIGN



# Adaptable to All Deep Drawing Press Operations

A cushion model and size for every press requirement.

Die cushion with hardened and ground pin pressure pad can be to an advantage on pressure pad control on a large percentage of your forming dies.

WRITE FOR CATALOG No. 100-12 DAYTON ROGERS

Manufacturing Company

MINNEAPOLIS 7, MINNESOTA



Bliss Hydraulic Compression Molding

loading of molds. The use of the dial provides for multiple opertions. While one mold is being pressed in the machine, another mold can be filled at the loading station while the previously pressed mold is being removed at the unloading station. Thus, several operators can be utilized.

Press control is effected by a hand lever with three positions; namely, "down," "neutral," and "up." When the lever is depressed, the slide closes rapidly, and a u t o m a t i c ally slows to pressing speed upon contact with the work. Pressure is

built up and maintained until the control lever is again moved. At neutral, the slide loses pressure but remains stationary; at up, the slide ascends at quick-reverse speed to the top-stroke position or until neutral or down control stations are resumed. Pressure is adjustable and uniform through a 14-inch stroke. An oil cooler is provided to maintain the most suitable temperature range for the equipment, which occupies a floor space of 74 x 91 inches and is 9½ feet high.

# Bliss Hydraulic Compression Molding Press

A hydraulic press specifically designed for the compression molding of ceramics is announced by the E. W. Bliss Co., Hydraulic Press Sales Div., Detroit 2, Mich. Of the two-rod down-moving type, the press is built in two standard sizes of 75 and 150 tons and is regularly equipped with a four-station manually-operated dial feed to facilitate the loading and un-

# PRODUCERS OF SCREW MACHINE PRODUCTS TO SPECIFICATIONS

We have:

ONE, FOUR and SIX spindle automatics maximum capacity 25%" round. Hand Screw Machines and Universal Turret Lathes maximum capacity 3" round. Castings and Forgings machined maximum 10" diameter, 8" length, 15 pound weight. Secondary operation equipment for milling, drilling, tapping and assembling. Fabricators of aluminum, brass, steel and their alloys.

WRITE FOR ESTIMATE

SCREW MACHINE SPECIALTY CO., • 5700 Butler St., Pittsburgh 1, Pa.

**Denison Multipress Midget** 

Especially designed for pressing requirements between 200 and 2,000 lb. ram effort, the Denison Multipress Midget, illustrated herewith, product of The Denison Engineering Co., Columbus 16, Ohio, is said to offer all the production-boosting features of the larger Multipresses, plus small, compact size. According to the manufacturer, the Multipress Midget is ideally suited for multiple or "gang" installations and for successive operation requirements. One cen-

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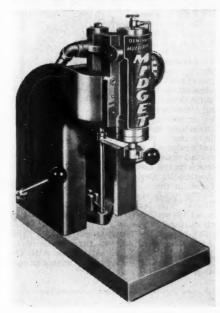
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Denison Multipress Midget

tralized power source is said to operate up to 12 units. When more than one Midget is used, each unit has individual pressure adjustments. The Midget may be operated in any position, and is easily adaptable to other hydraulic machinery as an accessory unit for pressing, clamping, feeding, and so on.

Three different base plate designs are included among choices of optional equipment, plus non-rotating ram guides, interchangeable valves for manual or vibratory action, adjustable daylight and throat depth clearances, and a choice of three pumping units for operation in ser-

ies of 4, 8, or 12 Midgets.

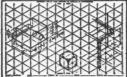




# Norgren Transparent Plastic Bowl Air Filter

A transparent plastic bowl air filter which is designed to eliminate oil emulsion, moisture, and solid impurities from compressed air lines is announced by the C. A. Norgren Co., 222 Santa Fe Dr., Denver 9, Colo. Centrifugal force is utilized to separate moisture from the air. A double right-angle air inlet imparts a violent swirling motion to the air as it enters the filter bowl. This "separator-action" throws the moisture against the wall of the bowl where it collects and

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One trial will
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WADE'S ISOMETRIC blue lined
paper. Shows all
surfaces and interior to scale.

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Wade Instrument Co. 1422 E. 109th St., Dept. H, Clevel'd, O.



# WALTHAM

Pinion and Gear Cutting Machines

with revolving cutter will make 1, 2 or 3 successive cuts for watch pinions or may be used for fine pitch gears up to  $1\frac{1}{2}$ " dia. Revolving cutter makes successive cuts on blanks held and indexed by work spindle and usually supported by a tail center. Only straight teeth can be cut. Write for Bulletin No. 112.

WALTHAM MACHINE WORKS

WALTHAM

MASS.

runs down into the "quiet zone" below the baffle plate.

A thin transparent plastic baffle, with holes on its periphery, divides the filter

bowl into two zones-anactive zone where separation takes place and a quiet zone where the moisture is allowed to accumulate instead of being driven along with the air. Throughthe transparent bowl the operator may actually see the moisture being separated and thus knows at all times whether or not accumulated muck the quiet in zone should be drained off through the bot-



Norgren Transparent Plastic Bowl Air Filter

tom cock. Centered in the bowl and directly above the baffle plate is a 200 mesh reinforced Monel wire screen which separates all solid impurities from the air as it leaves the filter.

The Norgren Transparent Plastic Bowl Air Filter is offered in three sizes of ¼, ¾, and ¼ inch I. P. All parts, with the exception of the body, are interchangeable between sizes.

Ritoloy Gage

The Rite-O Tool and Gage Co., 59 E. Eight Mile Rd., Hazel Park, Mich., announces a gage wherein an alloy, known as Ritoloy, is molecularly bonded to the steel base or shank of the gage. Designed to withstand shock, the alloy, it is claimed, will not peel, is not brittle, and, therefore, does not chip or crack. The finished gage, after grinding and lapping, has a Ritoloy thickness of 0.008 inch on the side. Ritoloy, however, can be applied to a thickness of as much as 0.035 inch on a side.

The company is also equipped to Ritoloy old steel or chrome plated gages or to build up worn Ritoloy Gages to size.

# G-E Type W-94 Electrode

An electrode for hard-surfacing applications where resistance to impact, wear, and abrasion is required has been announced by the General Electric Co., Schenectady, N. Y. Designated as the Type W-94, the electrode is said to work harden to over 54 Rockwell C and can be operated on a.c. or d.c. reverse polarity.

The G-E Type W-94 Electrode is available in 14-inch lengths with diameters of <sup>1</sup>/<sub>4</sub>, <sup>2</sup>/<sub>6</sub>, <sup>5</sup>/<sub>3</sub>, and <sup>1</sup>/<sub>8</sub> inch, and is supplied in 50-lb. standard packages.

### Baumbach "Rite-Fit" Dowel Pin

A self-sizing dowel pin which is said not to jam or stick when being driven into a hole is now being introduced by the E. A. Baumbach Mfg. Co., 1812 S. Kilbourn Ave., Chicago 23, Ill. Known as the "Rite-Fit," the pin is also said to remain tight and to be easy to remove.

The Baumbach Rite-Fit Dowel Pin is knurled on one end and is hardened and centerless ground to 0.001 inch oversize. Designed to act as a shear when being driven in, the ground knurled end sizes the hole and, at the same time, is claimed

to remove any irregularities left by drilling or reaming. The body of the dowel pin and the knurled section are the same diameter.

According to the manufacturer, the design of the Baumbach Rite-Fit Dowel Pin is such that there is no possibility of metal spreading in either the work



Baumbach "Rite-Fit" Dowel Pin

being doweled or the pin. Moreover, the pin is said to remain tight and can be easily removed and reused with the same tight fit assured. The pin is made from a special alloy steel of high manganese content and is ground 0.001 inch oversize, thus permitting the same pin to be used in holes that have been drilled or reamed anywhere from 0.002 inch undersize to 0.001 inch oversize.

# PUT A NICHOLSON AIR TRAP ON A TEST LINE

# → Here's What You'll Find

POSITIVE FLUID SEAL assures clean air without loss of medium.

FAST ACTION, due to intermittency.

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STAINLESS STEEL where it counts.

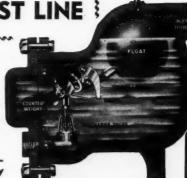
NON-WIRE DRAWING.

MINIMUM MAINTENANCE—Not easily affected by dirt, pulsation, etc.; easily connected.

# W. H. NICHOLSON & CO.

136 OREGON ST., WILKES-BARRE, PA.

Valves \* Floats \* Steam Specialties \* Mandrels



MODEL JR

Air traps for all applications, and for pressures to 1500

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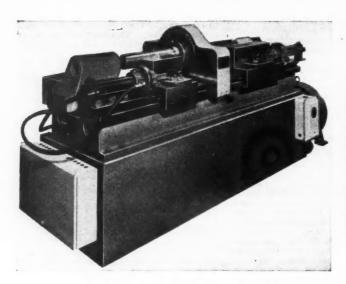
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drive type. The retracting tailstock of the machine is a id to simplify loading and unloading. The center drive unit is mounted on heavy duty Timken bearings.

ings.

The Benjamin
Shaft Automatic
has a capacity for
work from ½ to 4%
inches in diameter
and up to 60 inches
long, with a 7-inch
dead center space.

### Benjamin Shaft Automatic

A shaft automatic that is designed to reduce machining and handling time to a minimum is now being marketed under the trade name of Benjamin by the Stanford-Roberts Manufacturing Co., 619 E. Iron Ave., Dover, Ohio. Completely automatic in operation, the unit can be arranged to machine both ends of a shaft at the same time. The feed is hydraulic and is infinitely variable. The shaft is provided with three-point support—a heavy duty live center at each end plus an automatic center drive at the core diameter.

The tooling of the Benjamin Shaft Automatic is described as an all-carbide setup with maximum speeds and feeds and automatic chucking of the center

# American Combination Fluxing and Brazing Compound

The American Solder and Flux Co., Philadelphia 25, Pa., announces the development of a combination fluxing and brazing compound for use in gang brazing operations where several parts are to be brazed at the same time. It can be used with any of the common heating methods-torch, furnace, or induction. Containing the powdered metal in combination with the powdered flux, the compound can be mixed with water to form a smooth paste, which may be brushed on the work at any time prior to the actual brazing. The material is said to cover and spread well and remain in place during the usual manu-



# ELECTRIC ETCHER

SPECIFICATIONS—Navy bronze contact plate; Aluminum alloy case 4" x 8" x 10"; Weight 22 pounds; Recessed, heavy duty heat selector switch and pilot light; Handy cord storage compartment; Special current regulating transformer gives smooth etching action with the offset, coolgrip stylus. For operation on regular 110-volt AC lighting circuits. Fully guaranteed. Price \$67.50. Immediate delivery.

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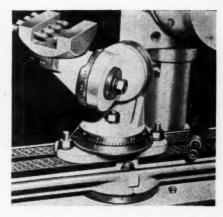
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Under the heat of brazing, the product melts readily to a liquid of low surface tension and low viscosity which flows over the surface to be brazed and penetrates into joints and between contacting surfaces. At the temperature of brazing, it is extremely active in cleaning all surfaces to prepare them for the union with the brazing metal. The finely divided condition of the alloy causes it to melt rapidly under the heat. Covered at all times by the molten flux, the compound does not develop heat oxides, it is claimed.

### "Knock-Out" Universal Tool Grinding Fixture

A universal work-holding fixture for use in grinding all types of lathe tools has been added to the line of "Knock-Out" products offered by the K. O. Lee Co., 1114 First Ave., S. E., Aberdeen, S.D. The fixture includes four graduated quadrants which permit the fast, accurate setting of any simple or compound angle.

While designed primarily for carbide and high speed tool grinding, the Knock-Out Universal Tool Grinding Fixture is



"Knock-Out" Universal Tool Grinding Fixture

also said to be useful in performing many other small grinding operations requiring simple and compound angles. The fixture is equipped with a 1½-inch vise (or 2-inch vise on order) and can be furnished to fit practically any make of cutter or surface grinder.



# R&n TAPS

Many of the Country's largest and most exacting Tap users rely on R & N to maintain peak production. Dependable performance is not a difficult assignment when R & N HSS Ground from the solid Taps are on the job.

Next time try R & N Taps.



Our new 109 page, No. 8 Catalog is ready for mailing. A request on your letterhead brings it.

# REIFF & NESTOR COMPANY

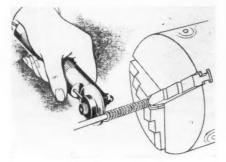
...Manufacturers...

LYKENS

PENNSYLVANIA

# Empire Universal Spring Winder

Greene, Tweed & Co., North Wales, Pa., announces the manufacture of a unique tool for producing springs of all types



Empire Universal Spring Winder

quickly, safely, and accurately. Designated as the Empire Universal Spring Winder, the tool is compact and light in weight and is said to be easy to operate. With the tool, wire is fed through the

handle, thus eliminating hazardous operation. The turns of the spring to be produced are preselected and fixed, and wire tension can be adjusted before and during the forming operation. The tool can be used in making all types of springs—both open and closed styles.

# "Petrofac" Cutting Oil

Increased productivity and lower operating expense are claimed to be provided the metal-working industry as a result of an all-petroleum cutting oil developed by the Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. The cutting oil is made with an entirely petroleum ingredient known as "Petrofac" which is said to eliminate the use of animal and vegetable fats in the cutting oil formula.

According to the manufacturer, both high speed automatic machines and extremely heavy duty equipment can be operated efficiently and with a minimum number of stoppages for tool resharpening when Pretrofac Cutting Oil is employed. Petrofac is said to assure the industrial user of a uniform cutting oil that cannot turn rancid and cannot support bacterial growth.



# Top Rim STEEL STACKING BOXES 18" x 12" x 6". 16 Ga. with Drop Handles

### STANDARD SIZES

16 x 10 x 6.....18 Ga. 16 x 10 x 6.....16 Ga. 18 x 12 x 6.....16 Ga.

18 x 12 x 8..... 16 Ga.

MADE IN OTHER SIZES



### WE MANUFACTURE ALL TYPES OF STEEL BOXES

We make a specialty of boxes made to fit your particular handling requirements. Special boxes designed so they can be run thru with standards enable us to quote prices comparable with that of a standard box.





Close-up view of loading end of Bellevue Continuous Type Stress Relieving Furnace

### Bellevue Continuous Type Stress Relieving Furnace

A continuous type furnace for relieving stresses in V-type automobile cylinder block castings has been brought out by the Bellevue Industrial Furnace Co., 2971 Bellevue Ave., Detroit 7, Mich. The furnace has inside dimensions of 3 feet wide x 4 feet 9 inches high x

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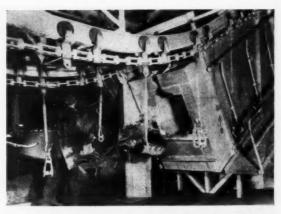
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70 feet long and is gas-fired with 40 pressure type burners.

The walls of the furnace are 9 inches thick, consisting of  $4\frac{1}{2}$  inches of 2,300 deg. F. insulating refractory backed up with  $4\frac{1}{2}$ -inches of 2,000-deg. F. insulating brick. The furnace includes two heat zones which are automatically controlled by a



Brown electronic potentiometer. The furnace casing consists of steel plate properly reinforced with structural steel shapes, and the entire unit is arranged for suspending from the ceiling. The bottom of the furnace is provided with four cleanout doors for the removal of sand. A catwalk running the full length on both sides of the furnace, together with two



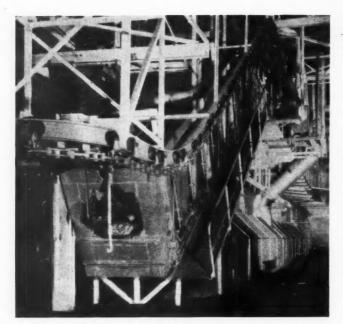


Illustration showing full length of Bellevue Continuous Type Stress Relieving Furnace, including supplementary tunneling providing enclosure for castings as they leave the furnace

light gauge sheet metal, the manufacturer claims. It is also recommended for welding light sections of mild steel to heavier ones.

The Hobart No. 13 Electrode is designed for use with d.c. straight polarity or a.c., and is available in 16, 18, and 18-inch diameters.

side doors that afford access to the furnace interior, are provided for servicing purposes.

# Hobart No. 13 Electrode

Designed to simplify the welding of light gauge mild steel, an electrode designated as the No. 13 is announced by The Hobart Brothers Co., Hobart Square, Troy, Ohio. Low penetration, ease of handling, and steady, uniform transfer of metal contribute to make the electrode extra fast for out-of-position welding on

# Tungsten Carbide Guard Blocks for Johansson Gage Blocks

Extra wear and protection for Johansson Gage Blocks are said to be provided by the use of sintered tungsten carbide guard blocks of super hardness developed by the Ford Motor Co., Johansson Division, 3607 Schaefer Rd., Dearborn, Mich. The blocks are available in thicknesses of 0.100 and 0.050 inch and are furnished in both the A and B standards of (plus or minus) 0.000004 and 0.000008 inch.

The guards are simply wrung onto the



# A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought a more accurate and surprisingly faster way of transferring blind screw holes.

The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in %" to 1" diameters. Send for price list.

HEIMANN MFG. CO.

330 Lincoln Ave.

Urbana, Ohio

end of any Jo-block combination and are said to fend off virtually all of the impact and abrasion of any gaging job. The gage blocks are fabricated from high grade stabilized steel and, with the addition of the guards, their unusually long period of service is claimed to be greatly lengthened.

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# Rack Engineering Hydraulic Feed Table Conveyor

The Rack Engineering Co., Dept. A-11, 5102 Butler St., Pittsburgh 1, Pa., announces the production of a hydraulic

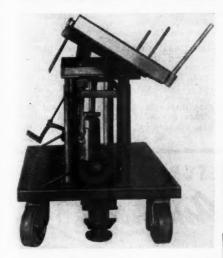
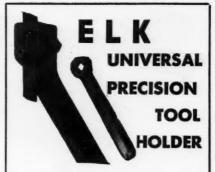


Fig. 1—Rack Engineering Hydraulic Feed Table Conveyor with top tilted to working position. Heavy duty floor lock is shown at the bottom front of the table.

feed table conveyor in capacity sizes ranging from 1 to 5 tons for handling sheets from 3 to 10 feet in length. The foot-operated hydraulic mechanism of the conveyor permits the operator to raise or lower the load to precise levels and to control the angle of the table top through its range of 40 deg., as shown in Fig. 1. When tilted to working condition, the top is held firmly in place by tilt locking pins at both ends of the table.

The manner in which the table conveyor is controlled allows the operator free use of both hands for transferring sheets from the table top into the die set.



REPLACES...
10 SINGLE-PURPOSE
TOOL HOLDERS

Round boring bars and internal threading tools can be used in the same tool holders.

Write for Bulletin

ELK TOOLS, Inc.

71 West Broadway

New York 7, N. Y.



 INTERCHANGEABLE HOLDERS MEAN TOOLS CAN BE ARRANGED IN ORDER DESIRED.

SAVES SPACE - EFFORT.

A flexible tool rack to suit your present tool equipment and to accommodate ad-

ditions. Sliding individual blocks accommodate each size tool.

ing variety of wood block holders and aluminum back strips available is sent with each order.

DEALERS INQUIRIES WELCOMED

Vanco Products Inc. COLORADO COLORADO



Equipped with 6-inch rolled bearing casters, two of which are of the swivel type, the table can be easily maneuvered about the plant floor when loaded to capacity. A heavy duty floor lock is said to ensure absolute stability when the unit is in working position. As shown in Fig. 2, a guard screen attached to the table top affords maximum protection to the op-

Fig. 2 — Front view of Rack Engineering Hydraulic Feed Table Conveyor showing g u ard screen for operator protection and pedal for operating hydraulic lifting mechanism

erator in all positions of lift and angle of the table top, the manufacturer claims.

# "National" Welding and Brazing Fluxes

Said to be guaranteed not to cast off

objectional fumes, gases, red flame, or smoke, a line of welding and brazing fluxes is now being marketed under the trade name of "National" by the Welding Equipment & Supply Co., 223 Leib St., Detroit 1, Mich. According to the manufacturer, the fluxes will not deteriorate or solidfy under any conditions, are economical to use, and require no

# CARBOLOY TIPPED SCRAPER BLADES

Especially good for hard alloy iron and extremely hard bronze castings. If you are using Anderson Hand Scrapers it is not necessary to buy complete new scrapers in order to use carboloy tipped blades. Simply remove highspeed blade and slip in the Anderson Carboloy Tipped Blade. Available in three widths.





Send for Bulletin 10-22

ANDERSON BROS. MFG. CO., Rockford, III.

See Our Catalog in Sweet's

Hand and Power Hydraulic Presses, Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters.

special handling technique.

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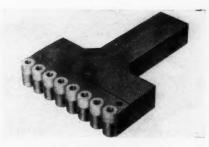
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National Welding and Brazing Fluxes are available in various grades as follows: No. 5 for welding cast iron; No. 10 for brazing iron, steel, malleable, and brass castings; No. 15 for brazing gray iron and malleable castings; and No. 20 for brazing brass, bronze, and copper.

# Kennametal Style RRT Roughing Roll-Turner Tool

A roughing roll-turner tool developed by Kennametal Inc., Latrobe, Pa., is designed for the high speed production and redressing of chilled cast iron rolls of any Schleroscope hardness rating. Designated as the Style RRT, the tool comprises a series of replaceable sharpedged solid Kennametal cemented carbide discs fastened to a heat-treated shank with countersunk cap screws and backed up by a hardened steel plate.

The first cut with the tool turns a series of circular grooves with rough humps, leaving a "scalloped" surface which is smoothed out with a block type of finishing tool, also produced by Kennametal. According to the manufacturer,

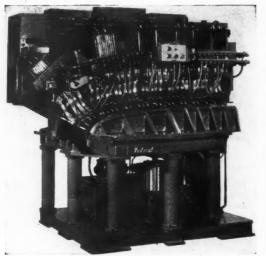


Kennametal Style RRT Roughing Roll-Turner Tool

operating advantages of the Style RRT tool include: easy cutting through scale; high roll-turning speeds; maximum metal removal per cut; quick turning up of roll; and minimum stock to be removed by the finishing tool.

Moreover, when the cutting discs of the tool become dull, they can be rotated to a new cutting position. Sharpening of the discs is said to be simple since only the tops need to be smoothed up; a disc that has been accidentally damaged can be quickly replaced with a new one.





Federal Multi-Point Spot Welder

The Federal Machine and Welder Co., 27 Dana St., Warren, Ohio, announces the development of a multi-point spot welder for spot welding front fender stampings to fender rails for a popular make automobile. The fabricated steel frame of the machine supports the stationary die unit and houses the welding transformers, clamping cylinders, and sequencing control. The fabricated steel clamping arm, which holds the 32 springloaded point body units, is actuated by two cylinders through a system of toggle links. The fixture stroke of from 6 to 8 inches allows for ease of loading, unloading, dressing, or changing of dies and electrodes.

An integral hydraulic pumping unit supplies the necessary oil pressure for operating with 32 double-acting welding guns which are epuipped with water cooled point holders and welding points. Nine welding transformers are provided, eight of which are employed when making 32 spot welds on the normal size fender and all nine of which are employed when welding the larger size fender on which 34 spot welds are made. The die holders and dies are interchangable to allow for welding the different sizes. The machine is arranged to fire half the transformers at a time but can be easily arranged to fire all welding transformers taneously if desired.

Indexing of the fixture, operation of the welding guns, welding, and reversing of these operations, as well as unclamping, are fully automatic. Clamping of the work is effected by means of a separate push-button control independ-

ent of the other operations.

# Standard Extra Heavy Duty Proper Speed Buffing and Polishing Lathe

The development of a proper speed buffing and polishing lathe featuring extra heavy duty construction to provide the increased capacity required when using semi-automatic fixtures is announced by The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio. The machine illustrated herewith is equipped with a 50 h.p. 1,800 r.p.m.



# GRAY TURRET HEAD METAI CUTTER OR NIBBLER

**Pioneer Award** W. Given to Gray

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tub-ing, Sheet & Plate Shops.

GRAY MACHINE CO. Box 596, Philadelphia, Pa.

# MUMMERT-DIXON SWING FRAME GRINDERS



s 12", 14", 16", 18", 20" and 24" wheels. Ask for Descriptive Circular MUMMERT - DIXON CO. 120 Philadelphia St. Hanover, Pa

Standard Extra Heavy Duty Proper Speed Buffing and Polishing Lathe

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N.E.M.A. frame ball bearing motor which is mounted on a hinged bed plate inside the base. Power is transmitted to the work spindle through a multiple V-belt drive. A hand adjusting screw at the rear of the machine allows for placing of the correct tension on the V-belt drive.

The spindle is of nickel steel,

with each end of the spindle provided with Acme threads and a hard bronze nut. A shaft lock for use in changing wheels is provided. The spindle is mounted on four ball bearings protected with labyrinth seals and equipped with liberal size oil reservoirs and sight feed oil gages. The diameter of the spindle between flanges is 2 inches. The machine is ordinarily furnished with a distance from the base to the inside of the wheel of 8½ inches, with greater clearances up to 17 or 20 inches available to individual order. The spindle speed is of the user's



particular selection.

The Standard Extra Heavy Duty Proper Speed Buffing and Polishing Lathe can also be obtained in sizes of 20, 25, 30, and 40 h.p. Standard equipment includes a magnetic starter having overload and undervoltage protection, and a separate start-stop push-button station. An advantage of the spindle construction is that the entire spindle assembly may be removed intact without disturbing the ball bearings, thereby not interfering with the internal parts, not exposing

# If you have a SPECIAL PROBLEM



in any of these operations, where precision work is demanded and where greater production at man-hour savings is paramount—

• BORING—rough, semi-finish and finish
• MILLING (special types) • STRAIGHT
LINE DRILLING • UNIVERSAL ADJUSTABLE SPINDLE DRILLING • HONING
• TAPPING • REAMING • COUNTERBORING • VERTICAL AND WAY-TYPE
EQUIPMENT

then a Moline Multiple Spindle Specially Designed machine tool is your answer. Moline tools are ruggedly built and engineered to fit your PARTICULAR requirements, they're made to last for years, they're easy to change over to other jobs, they do better work at less cost and stand up to it longer.

For YOUR special problem, go "HOLE-HOG," write us for any information you may need.

**MOLINE TOOL COMPANY** 

100 20th Street

Moline, Illinois

bearings to foreign materials, and so on. Moreover, this arrangement enables the V-belt drive to be quickly removed with a minimum of effort.

Studebaker Foot-Operated Hydraulic Speedvise

A foot-operated hydraulic Speedvise with built-in V-ways and gibs is announced by The Studebaker Machine Co., 1221 S. 9th Ave., Maywood, Ill. Elimination of hinging action under pressure and adjustment for wear are said to be effected by the built-in gibs which are made of high grade steel and set at a 45-deg. angle in the semi-steel V-ways.

The Studebaker Foot-Operated Hydraulic Speedvise is entirely self-contained, requiring no outside power source. With a few easy strokes of the foot-operated hydraulic pump unit, the operator can build up pressures from a feather-touch to a 7½-ton squeeze and can control the jaw action from very fast to very slow as required. Of rugged steel and semi-steel construction for heavy duty service, the unit can be used for production line work, clamping, holding,



Studebaker Foot-Operated Hydraulic Speedvise

forming, punching, bending, straightening, cutting, testing, stamping, riveting, assembling, and other operations.

Readily portable, the Studebaker Hydraulic Speedvise can be mounted horizontally on a bench, stand, drill press,

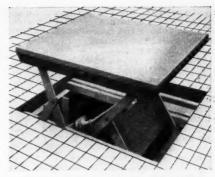


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planer, grinder, shaper, milling machine, and other equipment, or vertically on a wall or post. The unit is available in two models: No. 750 "Torpedo" having a 7½-inch maximum opening between the jaws, 4½-inch jaw depth, 5½-inch jaw width, and 7½-ton maximum jaw pressure; and No. 500 "Bullet" having a 5-inch maximum opening between jaws, 3-inch jaw depth, 4½-inch jaw width, and 5-ton maximum jaw pressure.

#### Samson Hydraulic Leveling Platform

Designed to level sheets or other material about to be processed through presses or other equipment, the Samson Hydraulic Leveling Platform illustrated herewith has been brought out by the General Sales & Engineering Co., 7358 N. Clark St., Chicago 26, Ill. Recommended for placement adjacent to the equipment that it is to serve, the platform is so constructed that, when completely lowered to floor level, the loaded skid may be safely driven over the platform. As sheets are taken off, the platform may be raised to keep the top sheet at the de-



Samson Hydraulic Leveling Table

sirable height until the skid is bare, at which time the skid can be returned to floor level.

The platform is actuated by hydraulic power, electrically generated and controlled for the safety of the equipment. A hydraulic valve in the feed line is used to control the raising and lowering of the platform. Safety devices are provided to prevent overloading and overtraveling of the platform, which has a maximum ca-



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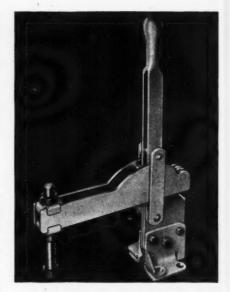
pacity of 2,000 lb. The platform, which measures 40 x 65 inches, may be elevated 30 inches above the floor line and is furnished with two guards for protection against foot accidents.

The electric motor used in powering the Samson Hydraulic Leveling Table is a 1 h.p., 3-phase, 60-cycle unit. The design of the platform also includes a 14 x 24 x 20-inch tank, on the top of which the pumping machinery is mounted. The platform is said to be equally capable of installation on the ground floor or on any upper floor.

#### Knu-Vise S-1100 Jumbo Clamp

Another Jumbo Clamp design is anannounced by Knu-Vise, Incorporated, Detroit, Mich. Known as the Model S-1100, the unit is similar to the Model V-1100 recently announced, but possesses a distinctive base with a swivel arrangement that permits angular clamping within 180 degrees and eliminates the necessity for shimming the base.

The base, with its integral front bracket and back support, can be turned with the mounting-side positioned vertically, either front or back, or at any



Knu-Vise Model S-1100 Jumbo Clamp

angle in between. Mounted with the face of the base toward the spindle, deflection at the latter is said to be only is inch; mounted on the opposite side, with the face of the base farthest from the spindle, the deflection is less than 32 inch, it is claimed.

The Knu-Vise Model S-1100 Jumbo Clamp measures 161/4 inches in height and 9% inches in overall length and weighs 71/4 lb. According to the manufacturer, a man's normal hand operation can exert a pressure of 1,350 lb. at the extreme end of the bar. Work is automatically locked by the characteristic toggle action of the clamp. The unique spindle assembly can be moved longitudinally along the toggle bar, thus permitting a wide range of adjustments. This assembly, however, can be removed and replaced by any special pressure pad of the user's own specifications to meet particular conditions.

# WATSON Tangent Cut Box Tool



A general purpose, tangent cut, roller rest box tool of wide range for turning diameters from bar stock, castings, forgings or other material. Applicable to all sorts of screw, turret and other machines, hand or automatic. It is simple to set and eliminates resetting when it is necessary to grind the bit. Write for descriptive folder giving complete information.

The Watson Mfg. Co. 2222 ALBION ST. TOLEDO 6, OHIO

# Caldwell Glass Bearing

A glass bearing which, it is claimed, can be lubricated with any material that is fluid, is now being offered to industry in various sizes and types by Caldwell Glass Bearings, Inc., 3920 Kellogg Ave., Cincinnati 26, Ohio. Made of steel and

(Left) Metal sleeve completely covered with glass. (Center) Complete-Caldwell Glass Bearing. (Right) Synthetic rubber sleeve which is slipped by compression over the shaft to prevent wear.

covered with acid-resisting glass, the bearing is designed for use in connection with a synthetic rubber sleeve which fits over the shaft and revolves against the glass-

protected surface with a minimum of

wearing friction.

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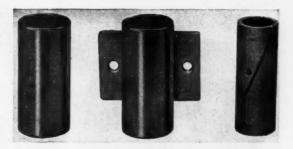
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The Caldwell Glass Bearing comprises a steel sleeve to which the glass bearing surface is directly fused. The glass is extremely hard, and the sleeve is turned smooth for a press fit into a spider. The wall of the sleeve is approximately 1/4 inch thick.

According to the manufacturer, an outstanding advantage of the Caldwell Glass Bearing is the fact that neither the synthetic rubber sleeve with which it is used nor the glass surface contains toxic materials, thus enabling the bearing to be used in direct contact with food mate-



rials since it will not change the taste, color, or odor. The bearing is likewise said to resist all commercial acids, water, greases, and oils.

# Clearing Series "S" Press

The Clearing Machine Corp., Chicago, Ill., announces a straight-sided press, designated as the Series "S," which is available in capacities ranging from 60 to 250 tons. The press is of all-welded steel. The bed is available in widths ranging



Plunger moves away from, instead of against the lever, protecting delicate parts from sudden or excessive jolts. Each graduation on scale represents 1/1000" movement of plunger. \$6.50.

# KOCH **Test Indicator**

Two working ends—one to test outside surfaces, the other inside. For precision work and toolmakers' use.

# Positive - Lock SURFACE GAGE

Drawbolt has positive lock to prevent slippage. Spindle: 9" x 5/16". Block: 31/4" x 21/2" x 1" with 90° angle groove in base. \$6.00.

Dealers wanted to sell these tools. If no dealer write for circulars on the Koch Test Indicator and the new toolmaker's surface gage.

#### ANDREW GENALES

28 SECOND AVENUE, NYACK, N. Y. Tel. NYack 2222





Clearing Series "S" Press

from 36 to 108 inches in increments of 6 to 12 inches, and in depths ranging from 28 to 44 inches. Stroke lengths may vary from as short as 3 or 4 inches to as long as 16 to 18 inches, and shut heights similarly are available over a wide range or to specifications to meet user requirements.

The slide adjustment of the press is of the barrel type in which the screw is not subject to bending since it is supported top and bottom in a cylinder or barrel. The adjustments of the two separate connecting screws are geared together to maintain uniformity of adjustment. The adjusting mechanism can be operated by hand or by an electric motor. In power adjustment, the motor is provided with a magnetic brake which automatically unlocks or locks the adjustment drive. The slide adjustment is also provided with limit switches to prevent over adjustment.

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The Clearing Series S Press is of the double-crank type with twin end drive. All gears are of steel cut from solid, and operate in oil. In most sizes, the press can be furnished either single or double geared. An outstanding feature of the machine is an air friction clutch interlocked with a spring actuated brake. The unit is electrically operated from one or more push-button stations located conveniently for the operator. The press is also equipped with air counterbalance cylinders and machined to receive standard air cushions.

# N. P. Differential Air Engine

The National Pneumatic Co., Rahway, N. J., announces a differential air engine of various sizes and ratings for general industrial applications. The differential principle employed in the engine permits operation with only one controlled air line. Consequent simplicity in piping and controls makes the engine particularly desirable for use in multiple hookups or where controls are located some distance from the engine. Moreover, positive air power is obtained in both directions, so that operating at 100 lb. air pressure, the engine is available in sizes to deliver "in-stroke" power ranging from 100 to 1,335 lb. and "out-stroke" power from 105 to 1,070 pounds.

The N. P. Differential Engine has a pis-



Worms — 32 D.P. to 5/7 D.P. 1/2" P.D. to 5"

P.D.

ABART GEAR & MACHINE CO. 4819 W. 16th St., Chicago 50, III. Cutaway View of N. P. Differential Air Engine

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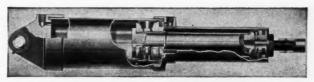
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ton assembly presenting two different diameters. Constant air pressure from the

reservoir is introduced between these two diameters. The pressure acting on the large and small ends of the piston assembly results in a force equal to the difference between the two areas of these ends. This force is exerted inward, toward the larger end. When the air pressure is applied to the large end of the cylinder, it counteracts or neutralizes the effect of the constant line pressure acting on the opposite side of this end of the piston. The outward force is then that developed by the constant line pressure acting against the small end of the piston assembly.

A non-locking piston rod is ensured by the two widely spaced bearing surfaces of the assembly. "Side-loading" is thus permitted, without concentration of load on one bearing point, and both power loss and piston rod locking are said to

be prevented.



Automatically adjusted air seals are provided by the piston cups. Air pressure against the cups causes them to expand evenly against the cylinder walls, automatically compensating for wear and affording permanent protection against leakage. Piston binding is said to be eliminated, since the differential engine parts are threaded so as to maintain precision alignment of the assembly.

#### Moline CF140 Special 29-Spindle Machine

Product of the Moline Tool Co., Moline, Ill., the Moline CF140 Special 29-Spindle Machine illustrated herewith is designed for the automatic drilling of all holes in aluminum header plates used in head transfer equipment for aircraft. Some of

DORMAN FRICTION TAPPER with AUTOMATIC REVERSE

Capacity in steel: No.1 size-2/56 to 3/8".

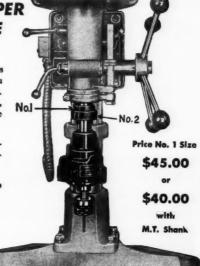
You don't need two or three different size tappers to handle a wide range of tapping. Nor do you need to hunt for collets to hold different size taps. By tightening one chuck screw of self centering, full floating chuck jaw the No. 1 will drive the above range of taps.

Attaches to all male spindle drills including Walker-Turner, Atlas, Buffalo Forge, Boice Crane, Canedy-Otto, etc., and to Morse Taper Drill Presses.

Also available in two larger sizes to take taps up to  $1\frac{1}{4}$ " in steel or other tapable material.

Round Spilt, Button or Acorn Die Holder Assemblies in stock for all size Dorman Tappers permitting their use for external threading.

Write for Die Holder Bulletin



DORMAN MACHINE TOOL WORKS 36 S. Mac Questen Parkway, Mount Vernon N Y

the plates to be drilled are of a shape which approaches an ellipse, whereon the major axis of the drilled area is about 25½ inches and the minor axis is ap-

Moline CF140 Special 29-Spindle Machine

proximately 13¼ inches. In this area, approximately 3,700 holes of slightly less than ¼-inch diameter are drilled in rows where the center-to-center distance from one hole to the next is only ¼ inch. The rows of holes are spaced slightly less than ¼ inch from the center line of one row to the center lines of adjacent rows, and the holes are staggered from one row

to the next. Also, there are wider row spacings at intervals to allow room for the insertion of baffles. The plates are stacked in pairs and one pair is drilled during a complete operating cycle of the machine.

The machine, as shown, is equipped with a means for automatic spindle selection, which is synchronized with the indexing of the work table. The spacing of the spindle is such that every third hole in a row is drilled at one pass of the drills. Thus, the table must index sideways twice to complete the drilling of each row of holes. The spindle selector drum has no motion either vertically or horizontally, but is indexed so that it turns on its horizontal axis at each pass of the drills. Each indexing motion brings a new row of holes in the spindle selector drum into position directly above the drill spindles. The work table on which the pair of plates to be drilled is mounted is moved up and down by cam action to produce rapid traverse and feed.

On the same slide with the table is mounted the rail which carries the drill spindles. Thus, when the table moves upward, the drills also move upward at the same rate. At the point where feed begins and the upper ends of the spindles reach the drum, the upward motion will end for any spindle which contacts a plug that has been inserted in the hole in the drum which happens to be directly above that particular spindle. Consequently, as the table continues to feed the work upward, the selected spindles will drill holes. After any one row of holes is completed, the work table moves at right angles to the rows of holes in order to locate the work in readiness for drilling the holes in the next row. This routine is continued with the spindles being selected and the indexing of the work both sidewise and from row to row of holes until all required holes have been drilled. The machine then stops automatically.





# Airco 28 Wear-Resistant Bronze Welding Rod

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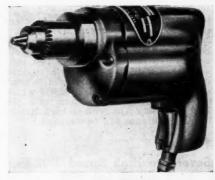
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Designated as the Airco 28, a wear-resistant bronze welding rod recommended for building up wear-resistant surfaces subject to heavy loads, especially where elevated temperatures are encountered, is announced by the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y. The rod is said to be particularly suitable in the railroad field for building up worn piston heads, valve bull rings, driving box laterals, shoes, wedges, and similar wearing parts.

According to the manufacturer, deposits made with the Airco 28 Welding Rod possess high weld strength and high hardness plus wear and corrosion resistance. The rod is said to average 8.65 on the Rockwell B scale and is recommended for use with Airco Hi-Test flux for maximum efficiency.

# "Metalmaster" 1/4-Inch Palm Drill

The Bradford Machine Tool Co., Cincinnati, Ohio, announces the addition to its line of "Metalmaster" portable elec-



"Metalmaster" 1/4-Inch Palm Drill

tric drills of the ¼-inch palm drill shown herewith. Designed to meet the need for a completely one-hand operated drill, the compactly constructed tool features a hand-fitted pistol grip incorporating a special trigger switch for intermittent use which can be locked for continuous operation or released with one finger of the gripping hand.

The Metalmaster 4-Inch Palm Drill is

# ROGERS

# PATENT ADJUSTABLE HOLLOW MILLING TOOL

Quickly and easily adjusted — rugged in construction—rigidly locked when on the job.

Carbide tipped blades optional, are quickly interchanged with the high speed steel blades, for cutting the harder or gritty materials.

The Rogers 61 years experience in Special Tool Design is always available to your firm.

Write for catalog

# THE JOHN M. ROGERS TOOL CORP.

Gloucester City

New Jersey



Fig. 20-Shank Integral

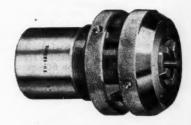


Fig. 23-Arbor Separate

equipped with ball bearings and heattreated chrome moly steel helical gears throughout. The design includes a 3-jaw Jacobs chuck with key and patented key holder, and 15 feet of 3-conductor rubber-covered cable with plug. The tool, which has a drilling capacity of ¼ inch in steel and ½ inch in hardwood, is powered by a 110-volt a.c.-d. c. motor which drives the drill at 1,100 r.p.m. with full load and 1,900 r.p.m. with no load. Motors in other voltages can be supplied.

#### Severance High Speed 3/32-Inch Shank Lab Mill

Severance Tool Industries Inc., 724 Iowa St., Saginaw, Mich., is now offering a high speed A-inch shank lab mill in 10 shapes and 6 sizes for use in the manufacture of Jewelry, Diesel injectors, aircraft parts, die castings, dies and molds, dentures, and many other small intricate parts. Ground from the solid after hardening, the mill is 1% inches in overall length and is available with cutting head diameters of from 15 to 15 inch in 15 inch steps. Intermediate fractional sizes are available on special order.

# TOOL ROOM OPTICS



THE BENTON CO.

in 60 seconds.

use . . . cheap to

Convenient to

buy.

Write to

DEPT. M., 351 S. LABREA, LOS ANGELES, CALIF.



Severance High Speed 3/32-Inch Shank Lab Mills

The Severance High Speed & Inch Shank Lab Mill is made of high grade steel and may be reground several times, thus ensuring productive use over a long period of time.

## Diamond-Miser

Diamond-Detroit, Inc., Detriot, Mich., announces the development of a device known as the Diamond-Miser, which is designed to hold a diamond dressing tool against a grinding wheel in such a manner as to produce a uniform rotation of



ATLANTIC GEAR WORKS, INC. 1984 Lafayette St., N. Y. 12, N. Y. CAnal 6-1441 the diamond and cause a new face to be presented to the wheel with each pass, thus to provide for clean and uniform dressings. According to the manufacturer, a periodic and uniform rotation of the diamond tool by means of the Diamond-Miser serves to maintain the proper shape of the diamond so that a point is constantly presented to the wheel being dressed.

The Diamond-Miser is available in three different models. The Model DMC2 is designed to automatically rotate the diamond tool by means of a cog wheel and trip. The Model DMN1 provides for



Diamond-Miser

hand indexing in front, while the Model DMB51 has an indexing disc in the rear. These models can be used on almost every type of grinder utilizing diamond dressing tools.

# Federal Bench-Type Combination Spot and Projection Welder

The Federal Machine and Welder Co., 27 Dana St., Warren, Ohio, announces a general purpose air-operated bench-type combination spot and projection welder for use in welding mild steel, stainless steel, aluminum, and so on. The machine is equipped with a special Federal low-inertia rubber head with micro-switch firing. The vertically adjustable lower knee is standard as are the horns and water-

TAPPING T What's Goin' To Become of the Chips? It's surprisin' in this tappin' business, how often some one little thing makes or breaks a inte rning makes or breaks of job. Fr instance, take the difference between tappin' through holes and blind holes. Now a spiral pointed and blind holes. Now a spiral pointed and blind holes. and office noises. Now a spring pointed tap's OK, for a through hole, or a through with plenty of room at the bothole with the bothole with plenty of room at the bothole with plenty of room at the bothole with plenty of room a tom. It cuts good and clean and is designed to get rid of the chips by soft of pushin' em ahead. But on a blind of pushin' em ahead. But on a blind hole you got to have a kind of back flow action. If you don't, the chips clog up, tear the threads and maybe break the tap. So a right hand spiral fluted top's the one to use. It helps keep the hole clean because the lubricant helps carry the chips out. So just try thinking in advance, what's goin' the of become chips?

Woody Spencer's Tapping Tips don't pretend to be any technical solution for all tapping problems. They simply aim to pass along to Woody's friends little, everyday hints that someone has found helpful in making routine tapping jobs run a little easier, maybe a little faster or better. The technical questions belong to the engineers and require specific solutions. So, if you're having tapping problems, send us complete details of the job (material, diameter, depth, lubricant, whether the hole is through or blind, etc.) and our engineers will be glad to make specific suggestions. No obligation, of course. \*NOTE - Woody Spencer's Tapping Tips

will appear here as regularly as "Woody" gets time to write them up. Look for them.

THE RIGHT TAP AT THE RIGHT TIME.

The West & Prencer Company

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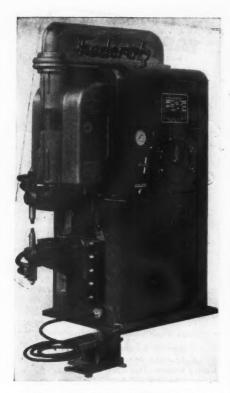
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Federal Bench-Type Combination Spot and Projection Welder

cooled point holders. The water-cooled ejector-type point holders are said to ensure maximum service and long life for the electrodes. The 30 kva transformer, contained within the frame, has six steps of heat regulation which are easily controlled by the tap switch arrangement shown in the accompanying illustration. The plug-in type foot operating switch leaves the operator's hands free to handle the material being welded.

The 2¼-inch stroke of the machine is actuated by an air-operated dougle-acting cylinder. The throat depth from the machine face to the center line of the electrodes is 6 inches; from the machine face to the center of the platens, 4½ inches. The machine shown in the accompanying illustration is furnished with T-slot platens, which can be furnished as optional equipment.

#### "Ring-Mike" Gage

All piston rings from 1½ to 10 inches in diameter can, it is claimed, be measured quickly and easily by unskilled operators through the use of the "Ring-Mike" Gage now being marketed by the Circle Gauge Co., 4750 York Blvd., Los Angeles 42, Calif. With the gage, the ring to be measured is drawn into an angle which causes each subsequent ring to be measured on the same center line, thus ensuring an accurate measurement on all sizes of rings, it is stated.

The Ring-Mike is set at the factory to read correctly. Readings are made on the dial through a powerful magnifying glass in both decimals and fractions. All working parts of the gage are enclosed, and the instrument is finished in baked enamel for durability.

The Ring-Mike Gage is available in three models as follows: Model No. 154 for measuring circumferences from 1½ to 4 inches; Model No. 255-6 for measuring circumferences from 2 to 6 inches; and Model No. 610 for measuring circumferences from 6 to 10 inches. In addition to use in measuring the circumferences of



# TRICO

Automatic, accurate, dependable lubrication . . . ne guess - work, bearing failures, idle machines or waste. There's a type for every application. Write for Catalos

TRICO FUSE MFG. CO.

# GAGES AT 1/2 PRICE

NEW Vard thread gages to  $1\frac{1}{2}$ "...plug, ring, snap. Our complete stock at 50% off list. Specials at price of standards. Write for latest stock list.

PAUL B. SLATER CO. 1025 Sente fo Ave. Les Angeles 21, Calif. nt n.

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id rpistons and piston rings, the gage can also be employed for measuring the circumferences of tubing, pipe, steel, and other products.

Further information regarding the application of the "Ring-Mike" Gage will be furnished by Circle Gage Co. upon request.



#### Natco A-42 Electronic Mechanical Feed Unit

Said to fully meet the demand of the metal-working industry for a flexible, positive feed machine, the Natoo A-42 Electronic Mechanical Feed Unit illustrated herewith has been brought out by the National Automatic Tool Co., Inc., Dept. 27, Richmond, Ind. Used for drilling, reaming, boring, facing, and tapping operations, the unit is claimed to be positive in performance and flexible for setup.

Adaptable for use in a wide variety of working conditions, the Natco A-42 El-

ectronic Mechanical Feed Unit permits automatic work cycles such as rapid traverse forward, coarse feed forward, fine feed forward, dwell, rapid traverse, and stop, or rapid traverse forward, feed forward, feed reverse, rapid traverse reverse, and stop, and many other combinations of movements to be readily obtained. A smooth, positive feed movement is said to be imparted to the toolslide through an anti-friction ball screw and nut assembly driven through a mechanical transmission by an electronically controlled variable speed motor which makes possible any feed rate adjustment

# HALL()WELL

# TOOL STANDS OF STEEL

These "Hallowell" Tool Stands of sturdy, all-steel, welded construction are equipped with free-rolling casters, which enable you to keep your tools with you as you move from job to job, and they provide long, trouble-free and time-saving service. The steel drawers, as shown, can be locked to protect your tools. They are available with two drawers as illustrated at right... with one drawer... or without drawers, depending on your needs.

"Unbrako" and "Hallowell" Products are sold entirely through industrial Distributors.



OVER 44 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN PENNA, 80% 556 - BRANCHES ROSTON - CHICAGO - DETROIT - INDIANAPOLIS - ST. LOUIS - SAN FRANCISCO

within the feed range. The slide is mounted on a wide way base equipped with hardened and ground steel ways of the narrow guide style which are automatically pressure lubricated at each cycle.

A spindle or combination of spindles in a head with a drive motor is mounted on the flat side. The head, of a style and size to suit the application, is directly driven through a flexible coupling by an electric motor (5 h.p., 1,200 r.p.m. max.)

The adjustable feed controls are locked within the electrical panel to prevent tampering by unauthorized personnel. An electrical speed indicator, mounted in full view of the machine operator, continuously indicates the rate of feed. master control push-button station is provided on machines with two or more units. For routine operations, all unit cycles are initiated simultaneously, however, independent control is provided for set-up purposes, thus permitting the cycling of each unit independently.

The Natco A-42 Electronic Mechanical Feed Unit is flexible and completely selfcontained, requiring only electrical connections. The unit may be mounted in any position, thus making possible the construction of highly specialized ma-



Natco A-42 Electronic Mechanical Feed Unit

chines built up of a combination of units for the high production of a wide variety of work.

### Fafnir Series W-PP Plya-Seal Ball Bearing

The Fafnir Bearing Co., New Britain, Conn., announces the addition to its line of Plya-Seal Bearings of a wide type ball bearing designated as the Series W-PP. The bearing is of the same width as the standard double-row ball bearing but incorporates only a single row of balls. Plya-Seals are provided on both sides for the retention of lubricant and the ex-

clusion of foreign material.

The principal advantage claimed for the Fafnir Series W-PP Plya-Seal Ball Bearing is the fact that it is a self-contained anti-friction unit having a large sealed-in supply of factory packed grease ample for years of operation. According to the manufacturer, the use of a single row of balls in a double-row width provides space for a long-time supply of grease without total filling, thus permitting "breathing," grease expansion due to aeration and agitation under high speed without leakage. The double width is said to ensure maximum shaft and housing support without slippage; the wide inner-ring face provides "pull off" face area over standard shaft shoulder diameters.

The Series W-PP bearing utilizes threepiece Plya-Seals, each a synthetic rubberimpregnated sealing washer supported between two steel split retaining rings. The seal is said to be impervious to grease and the common contaminants. Snapped into the outer ring with its supporting steel washers, the seal, it is claimed, cannot bulge or buckle. A wide clearance is provided between the seal and the ball retainer, with the seal being readily removable with a penknife.



The Series W-PP bearing is produced in bore sizes from 20 to 70 mm., and is said to be particularly applicable to electric motors and textile machinery, as well as automotive pumps and generators, machine tools and other equipment.

# Air-Hydraulic 10-Ton Foot-Operated Hydraulic Arbor Press

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Said to be ideally suited for machine shops, toolrooms, and garages for press fitting, staking, assembly, riveting, crimping, and so on, the Air Hydraulic 10-Ton Foot-Operated Hydraulic Arbor Press illustrated herewith has been brought out by Air-Hydraulics, Inc., 401 Broadway, New York 13, N. Y. The pressure is entirely hydraulically controlled by an efficient foot-pump unit, thus leaving the operator's hands free to handle and position the work. Each stroke of the center pedal provides for a %-inch downward movement of the ram toward the work. The right pedal or power pump moves the ram down  $\frac{1}{16}$  inch with each stroke. A

slight pressure on the left pedal permits the ram to return to its original position.

The press housing is of cast steel, accurately machined. The platen is of machine steel and is precision ground to provide an ideal surface for mounting dies. The foot-pump block is of Meehanite metal to withstand high pressure. The pump base and pedals are cast of semi-steel. A removable screen is fitted to the oil reservoir to keep out foreign matter which might damage the pump and ram cylinder.



Air-Hydraulic 10-Ton Foot-Operated Hydraulic Arbor Press

The Air-Hydraulic 10-Ton Foot-Operated Hydraulic Arbor Press is designed to deliver pressures up to 20,000 lb. and is said to require very little effort to operate.

# WANT REALLY SHARP CORNERS ON THIN GRINDING WHEELS?

"Just Call On Me!"
Says The Metcalf Minute Man

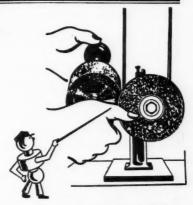
What The Metcalf Wheel Dresser Does:

- \* Brings up sharp corners on thin wheels.
- \* Trues up a square edge.
- \* Turns a bevel rapidly and accurately.

Famous three-fold Metcalf principle:

- \* Cutting effect of one abrasive wheel on another.
- \* Hi-speed, gyroscopic action.
- \* Steadying effect of heavy ball-handles.

Dresser-Wheel replacement costs little—means added savings and greater profits for you. Write today for full details in Bulletin M-107.



FOR LARGE WHEELS WOLVERINE DRESSER, HAND MODEL.



HANCHETT MANUFACTURING CO.

SAW SYAPPERCES
SAW STATEMENT
SAW STATEMENT
SAW STATEMENT
SWARES AND SWAPPE
WELDING STAMPE

## Gray-Mills Model H-83 Agitor Parts Cleaning System

The Gray-Mills Corp., Evanston, Ill., announces the addition to its line of Agitor cold parts cleaning systems of the



Gray-Mills Model H-83 Agitor Parts Clean-ing System

Model H-83 illustrated herewith. The unit measures 21 inches square with an overall

height of 34 inches. and has a solvent capacity of 24 gallons.

Air agitation and high volume hose cleaning are com-bined in the Model H-83 for two-way utility. An improvhigh volume ed centrifugal pumping unit for flushing out recesses and removing softened grease or for brush cleaning the parts under flowing solvent is provided.

The unit uses cold solvent, no heating being required. A work shelf to accommodate parts being cleaned is built inside the tank. This shelf can be slid out of the way to make the entire tank area available for soaking larger parts under air agitation.

An improved safety device incorporating a fuseable fire-link which melts at 165 deg. is built into the Model H-83, which is mounted on revolving casters for portability. The unit is designed for use in machine shops, maintenance and service departments, and for cleaning tools, dies, and fabricated metal parts.

## **Acme 6-Ton Hydraulic Press**

The accompanying illustration shows a 6-ton hydraulic press which has been developed by the Acme Broach Corp., E Third St., at Delaware, Lexington 47, Ky. The design of the machine includes a deep column which allows for mounting of the motor inside the column and provides a cross section that assures rigidity and reduces deflection to a minimum.

An outstanding feature claimed for the machine is its capability for performing any type of operation within its capacity. The illustration shows the machine equipped with a standard work table which is bolted to the extended foot of the column, as well as to the vertical face. With such a table, the machine is claimed to be ideal for push broaching and assembly work. When the work table is removed, an open space is provided between the top of the finished foot and the end of the ram of 50 inches when the ram is in its upper position. With the work table removed, the press is said to be well suited for use as a "horning press" and allows for the mounting of any type of special table desired, including such types as are used for straightening operations. Tables may be mounted on the foot of the column and bolted to the upright member of the column, and can be furnished in any length required.

Equipped with a standard table as shown, the Acme 6-Ton Hydraulic Press is claimed to be ideally suited for broaching and assembling operations, the table being provided with a steel work plate 10 x 25 inches which is ground on both surfaces and bored with a 3-inch diameter hole so that bushings to suit various work parts may be inserted. The machine may be controlled either by a hand lever

or foot pedal.

The hand lever is adjustable for height,





as well as from a horizontal position (for use when operator is standing) to a position several degrees below horizontal for the operator's convenience when operating the machine from a sitting position. Both the hand lever and foot pedal control provide for a sensitive pressure stroke. The release of either of these controls during or after the pressure stroke permits the ram to return to "up" position. The stroke of the machine can be set as desired up to 24 inches maximum, and is controlled by stop dogs that can be quickly set to suit requirements.

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The machine incorporates a heavy steel cylinder that is honed to a high mirror



Acme 6-Ton Hydraulic Press

finish and is fitted centrally in the upper housing of the column. The ram of the machine is of the conventional hardened and ground type, the work end being tapped 2-inch 8-pitch with a ground bore immediately ahead of the thread in order to accurately centralize any adapter or receptacle that may be screwed into the ram. An oil pressure gage is mounted on the column at eye level and to the right of the ram so that it is in an ideal visual position for the operator. A push-button

# SAVE HANDLING

By LYON-Raymond
Hydraulic Sheet & Strip
FEEDING TABLES



No Lifting! No Stooping! No Tugging!

NOW—a press or shear operator can keep a diminishing stack of material constantly at the perfect feeding level.

No need to lift, or stoop, or tug, or haul. He just slides each sheet or strip into position easily, quickly,



NEW

METHOD

Doesn't have to leave his position! A pedal-operated hydraulic pump—located wherever convenient to the operator—elevates the table as the feeding operation requires.

Models of 2,000, 4,000, 6,000 and 10,000 lb. capacities, non-tilting (for horizontal bed presses) or adjustable tilting top (for inclined presses). Various standard size table tops.

WRITE—Here's money-saving information on this shop-proved LYON-Raymond sheet feeding table. Folder sent free, without obligation, on your request.

> EXHIBITING AT MATERIALS HANDLING EXPOSITION

LYON-Raymond
Corporation

835 Madison St. Greene, N. Y.

switch is located on the opposite side and also on the front of the column, thus permitting the operator quick and convenient access to the switch with the left hand and allowing use of the right hand for the operation of the machine.

Hydraulic oil can be easily put in the press by removing a plate at the back of the machine. Also, by removing a plate from the back of the column, the motor may be reached, and, if necessary, can be easily slipped out of the machine and without disconnecting the wiring.

## Lyon-Raymond Hydraulic Toggle-Lever Type Sheet Feeding Table

A hydraulic toggle-lever type sheet feeding table for handling and feeding to presses and shears loads of sheet steel up to 10,000 lb., is now being manufactured by the Lyon-Raymond Corp., 3733 Madison St., Greene, N. Y. Stock may be loaded on the table by a fork truck or overhead means either in the stockroom or at the press. The table is portable for transporting loads, and hydraulic elevation permits leveling of the load with the press bed for efficient horizontal feeding.

The principal advantage claimed for the toggle-lever design of the unit is the full support provided to the entire length of the table top—a particularly desirable construction where long, heavy loads are being handled. The lifting action is obtained by a hydraulic pump through hydraulic cylinders which operate laterally against the toggle-lever mechanism. The table guides are inverted so that no uprights extend above the table top.

The Lyon-Raymond Hydraulic Toggle-Lever Type Sheet Feeding Table has a 30-inch wide x 96-inch long top and features a lowered height of 22 inches, elevated height of 34 inches, and total lift of 12 inches. It is equipped with a



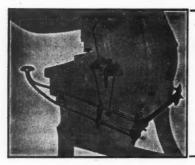
Lyon-Raymond Hydraulic Toggle-Lever Type Sheet Feeding Table

set of 12-inch diameter wheels, a set of 8-inch diameter swivel casters (illustration shows unit with 4 swivel casters for a special requirement), floor lock, and 2-speed hydraulic foot pump. The pump may be mounted on the unit or furnished with a flexible hose attachment for placing wherever most convenient for the operator. A motor-driven pump with pushbutton controls is an optional feature.

Extensions for the table top may be furnished for the support of loads wider than 30 inches and longer than 96 inches. Also available are superstructures of any thickness to increase the height of the table top, retaining the 12-inch lift.

#### Milwaukee Profile Grinder

A bench-type high speed profile grinder for use in performing toolroom, machine shop, or production grinding oper-



# SAFETY EQUIPMENT FOR POWER AND FOOT PRESSES

Combination Gate and Barrier Guards Two-Hand Safety Starting Devices Sweep Guards . . . Single-Stroke Attachments Stock Reels . . . Fly Wheel Guards, etc.

Write for Details

JOHN HUMM SAFETY EQUIPMENT CO.
251 SHEFFIELD AVE. BROOKLYN, N. Y.

ations has been introduced by the Milwaukee Chaplet & Mfg. Co., Milwaukee, Wis. Designed specifically for the precision grinding of interior and exterior profiles, curved, odd and irregular surfaces, the unit provides a high degree of accuracy in the finishing of hardened steel parts for tools, dies, jigs, and fixtures.

The functional work table may be tilted 15 deg. in any direction. The desired angle of inclination is indicated by a graduated dial and pointer. This tilting mechanism permits an extremely wide range in the grinding of angles, curves, and contours. In addition, the table has a 3½-inch vertical adjustment actuated by a convenient crank handle, and is locked at the desired height by a hand knob. The table surface is serrated to catch grindings and is free of tapped holes, T-slots, and other obstructions which might prevent smooth, level movement of the workpiece.

An outstanding feature of the Milwaukee Profile Grinder is a built-in diamond dresser which is instantly accessible for keeping wheels free and in a maximum cutting condition. After the diamond, which slides in a sleeve, is brought close to the wheel, the holder is locked in position. The diamond is then "fed" to the



Milwaukee Profile Grinder

wheel by rotating the sleeve, which is threaded for the purpose.

A high speed motor drives the vertical spindle of the machine at 20,000 r.p.m., the motor having ample power for accommodating a full range of grinding wheels from ½ to 1½ inches. The spindle, which reciprocates ½ inch vertically 100 times per minute, is said to result in freecutting, even-wearing wheels and high



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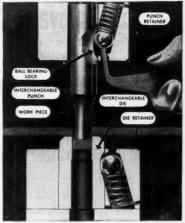
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# INTERCHANGEABLE PUNCHES and DIES

# Quickly Inserted... Rigidly Held!

Allied's R-B Interchangeable Punches and Dies are quickly inserted—rigidly held for accurate, trouble-free punching in the metal-working and plastics industries. They are available from stock in **standard** round, oblong and square shapes of almost any required size. Specials of any size, shape or material are promptly furnished to your specifications... and delivery dates are **dependable**.

Large, illustrated R-B Catalog gives complete details, specifications. Write for it.





# **ALLIED PRODUCTS CORPORATION**

Department 22 • 4624 Lawton Ave. • Detroit 8, Michigan

cutting efficiency.

The Milwaukee Profile Grinder can be quickly and easily inspected or serviced if necessary. By removing two bolts, the front half of the housing may be lifted off, thereby exposing the entire mechanism. All external parts are attached to the front half of the housing, and internal parts are mounted panel-style on the inside of the rear half.

#### De-Sta-Co Model 464 Plier Clamp

As an addition to its line of De-Sta-Co portable toggle clamping tools, the Detroit Stamping Co., Dept. K, 349 Midland Ave., Detroit 3, Mich., announces the De-Sta-Co Model 464 Plier Clamp illustrated herewith, which is designed for sheet metal work, plastic sheet cementing or laminating, and other operations necessitating quick, positive pressure on relatively light gauge materials up to %-inch total thickness. Toggle-lock action holds parts in position for drilling, riveting, welding, and gluing on such products as sheet metal ducts, housings, cabinets of plastic, wood and metal, automobile bodies, and aircraft assemblies.

Claimed to be especially suitable for



De-Sta-Co Model 464 Plier Clamp

template locating, the Model 464 clamp is adjustable for efficient pressures on various thicknesses of material and provides a firm hand grip for opening and closing. The nose of the clamp is made narrow to allow for use in restricted areas. The entire tool is forged and may be revamped for special applications by welding, grinding, and so on. To minimize wear, replaceable hardened steel bushings are used throughout.

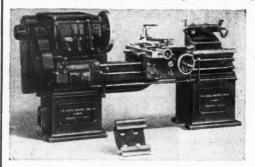
## Moore Model No. 2 Jig Borer

The Moore Special Tool Co., Inc., Bridgeport, Conn., announces a jig boring machine which is designed to jig bore holes up 5 inches in mild steel or cast iron. Designated as the Model No. 2, the

# **NEBEL Removable Block Gap Lathes**

Geared Head Motor Driven Type, 3 Step Cone Double Back Gear Belt Driven Type or with Motorized Headstock. Especially adapted for repair and maintenance as well as for general manufacturing. Handle a large variety of work with large

swing through the gap.



All Geared headstock type completely equipped with Timken Bearings, headstock completely enclosed, running in oil, with motor mounted on rear of lathe, drive through multiple vee belts and friction clutch. Standard equipment consists of: Quick change gear box, compound rest, steady rest, chasing dial, face plate, driver plate, wrenches, tool post and centers.

Furnished in four different sizes as follows: Series "LN" 18/27", Series "AA" 20/30", Series "B" 22/34", and Series "D" 25/40".

Write for Circular Giving Complete Information

The Nebel Wasters Tool Co.

machine provides infinitely variable spindle speeds, push-button controlled with a range of from 90 to 2,400 r.p.m. Moreover, the machine provides three power feed ratios of 0.0015, 0.003, and 0.006 inch per revolution of the spindle in either direction.

Additional features of the Moore Model No. 2 Jig Borer include centralized control panel (and tachometer) for spindle speeds and one-shot lubrication; disconnect clutch for easy indicating; satin chrome finish on all dials and handwheels to eliminate glare and rust; trip mechanism to prevent jamming of lead screw nuts through overtravel; totally enclosed

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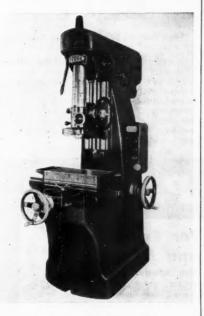
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Moore Model No. 2 Jig Borer

drive mechanism; hardened, ground, and lapped lead screws for precise, rapid table settings within 0.0001 inch by coordinate location; hardened, ground, and lapped quill supported by hardened, ground, and lapped bushings; preloaded super-precision ball bearing spindle with totally enclosed spindle and quill; and controls which are within easy reach of the operator from sitting position.

Specifications of the Moore Model No. 2 Jig Borer are as follows: table working



# with KVE Micrometer Stop

Set stock lengths accurately to 1,000th of an inch—after only ONE trial run! You save materials and costly screw machine set-up time when you make quick, sure adjustments with the new KVE Micrometer Stop.

Adaptable to all automatic and hand screw machines. Shank diameters: 5/8, 3/4, and 1 inch. Price \$7.50 postpaid. Start saving money for your plant—mail your order for KVE Micrometer Stops today!





surface, 10 x 19 inches; longitudinal table travel, 16½ inches; crosswise table travel, 10½ inches; minimum and maximum distance from table top to spindle end, 3 to 18 inches respectively; vertical adjustment of quill housing, 10 inches; spindle quill travel, 5 inches; spindle center to column ways, 10 inches; and spindle center to below column ways, 11½ inches.

### Trico U-66 All-Purpose Kliplok Test Clamp

To meet the rapidly growing need of production and maintenance men for a sturdy, heavy duty, shockproof clamp which can be attached to the ends of cords on portable equipment, such as floodlights, sanding machines, floor polishers, dust collectors, furnace cleaners, drills, welders, and so on, the Trico Fuse Manufacturing Co., 2948 N. 5th St., Milwaukee 12, Wis., has brought out the Trico U-66 All-Purpose Kliplok Test Clamp illustrated herewith. The clamp is designed to provide a viselike grip on flat or round objects up to 1 inch in diameter or width, such as fuse clips, meter or

motor terminals, cables, bus bars, lugs, screws, battery parts, and so on.

A slight twist of the large finger-tip knob of the clamp is said to provide for



Trico U-66 All-Purpose Kliplok Test Clamp

the exertion of a high holding pressure. The unit is designed to carry up to 150 amperes continuously and 200 amperes intermittently. The solderless lug is constructed to accommodate No. 2 wire minimum and No. 0 wire maximum, and can be swiveled around the clamp, thus permitting wire or cable to hang in a natural position.

# DIE CUT PARTS



# For Experimental and Model Work

Our Specialty: Small irregular shaped parts stamped, formed, pierced, extruded or tapped to your specifications using our new method of semi-permanent dies in conjunction with our quick-process temporary dies.

For detailed information send for literature. For firm quotations and delivery commitments, send us your prints.

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## Numberall Improved Model 70 Stamping Tool

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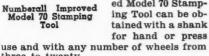
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Made in one piece instead of two as heretofore, the Numberall Improved Mod-

el 70 Stamping Tool illustrated herewith, product of the Numberall Stamp & Tool Co., Dept. MS - 70, Huguenot Park, Staten Island N. Y., is arranged to repeat the same numbers until changed. According to the manufacturer, the tool can be used in all industries to mark various parts with numbers, and so on, quickly and neatly. Constructed so as

to provide for accurate alignment, the Numberall Improved Model 70 Stamping Tool can be obtained with a shank



three to twenty.

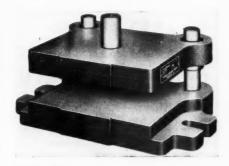
MBERAL

STAMP & TOOL CO

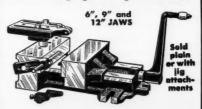
# "Standard" All-Steel Die Set

An all-steel die set in a complete range of sizes for all types of presses is now being offered by the Standard Machinery

"Standard" All-Steel Die Set



# Here's your fixture already partly made



# GRAHAM MULTI-PURPOSE VISE

With available attachments such as shell jaws, V-jaws, stops, drill guides, etc., or other attachments you can easily add. This vise becomes an accurate jig or fixture for repeat-operation positioning. Sizes up to 124 lbs. for drill press, miller, planer, shaper, radial, grinder.

# "Adjust-angle" KNURL HOLDER

Many patterns using only straight knurls



Knurls adjustable to produce variety of straight, spiral or checkered pat-terns. Sizes for work up to  $2\frac{1}{2}$ " dia. Shank to fit your turret.

# Request Bulletin 41

giving full details of applications and prices.



GRAHAM MFG. CO.

36 BRIDGE ST.

EAST GREENWICH, R. I.

Co., Providence, R. I. All parts of the unit are ground and bored to unusually close limits, with the die shoe, punch holder, pins, and bushings fully interchangeable from stock without rework or fitting.

Special die sets can be made to order.

#### Clifco Blade

A centerless grinder work rest blade combining the hardness of tungsten carbide with the strength of steel, thus pro-



Clifco Blade

viding for unusually long life, has been developed by The Cliff Co., 17 N. Leclaire Ave., Chicago 44, Ill. Designated as the Clifco, the blade features at the wearing surface sectional inserts of tungsten carbide separated by thin strips of a specially developed alloy and laid in a slot with supporting walls of steel. Thus reinforced, the blade provides a tungsten carbide surface for rough grinding and other operations. In addition, the blade is said to provide for unusually long life in the performance of other types of operations such as finish grinding.

According to the manufacturer, the principle of the construction and operation of the Clifco Blade is three-fold: (1) the supporting separators and steel walls around the tungsten carbide inserts prevent chipping; (2) the supporting walls also permit the use of an unusually hard tungsten carbide (Grade CA-4 Carmet), thus providing for maximum abrasion

resistance; and (3) the supported construction enables the tungsten carbide surface to be laid unusually deep, thereby allowing for many resurfacings. Simplicity and economy of making repairs, similarly allowed for by the sectional construction, is an additional advantage claimed for the blade, which it is stated can be used successfully on literally every type of centerless grinding operation, including jobs on stainless steel, aluminum, brass, Alnico, tool steel, and various other metals.

## Fonda Square Lifetime-Carbide Gage Block

The Fonda Gage Co., Stamford, Conn., announces the addition of a square style gage block to its line of Lifetime-Carbide gage blocks. The block is manufactured

in both Grade "A"  $(\pm 0.000004 \text{ in c h})$ and Grade "B" (±0.000008 inch) quality and in the full range of sets and sizes heretofore available only in the rectangular Lifetime-Carbide gage blocks. Individual blocks range in size from 0.050 to 4.000 inches; complete sets are made up of 35 and 82 pieces. Special sizes of blocks are also available on order.



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Fonda Square Lifetime - Carbide Gage Block

According to the manufacturer, the Fonda Square Lifetime-Carbide Gage Block is guaranteed not to grow or shrink over any period of time, possesses unusual resistance to corrosion, is extremely wear-resistant, and will retain its orig-



# GEARS GOOD GEARS ONLY All Kinds—Any Quantity AT THE RIGHT PRICE THE CINCINNATI GEAR CO. Weester Pike Cincinnati, Ohio

346

inal surface finish over a long period. In addition, its flatness and parallelism are claimed to remain constant under all working temperatures.

#### "Handishear"

A universal throatless shear which can be readily adapted to a variety of cutting operations, to be known as the "Handishear," is now being produced by the Mechanical Service and Manufacturing Co., 7141 S. Racine Ave., Chicago 36, Ill. On close intricate cuts on a bench, or detached from its base with auxiliary handle for cutting large versatile shapes



"Handishear" Mounted for Intricate Cutting

on the floor, the shear is said to be operated with maximum ease.

The Handishear can be used for cutting curves, angles, or radii, the patterns always being in full view of the operator for most exacting cutting requirements and all within the bounds of a sheet of metal. The starting point of any pattern can be cut from the most economical point nearest the work, thus saving time, metal and effort. Circles can be cut from within their own circumferences.

The Handishear is made of chromenickel-molybdenum alloy to provide for maximum strength, and the high grade high chrome, high carbon steel blades are removable for sharpening or replacing. The blades are said to provide clean-



# NO TROUBLE — If you have a set of WALTON EXTRACTORS

when Taps break off!

ALUMINUM FOUNDRY Dept. MM107,

Davenport, Iowa

211 Marquette St.,

Prices
range from
\$1.50 to \$2.20
for the
popular sizes.

Write for folder
No. 10 and for
details of 30 DAY
FREE TRIAL
OFFER.

# THE WALTON COMPANY

94 Allyn St. Hartford, Conn.

cut sheared edges free from burrs. The Handishear has a capacity for cutting 14 gauge mild or 18 gauge stainless steel from the same blade, thus eliminating the need for changing the blades. Designed for permanent mounting or removable from its base for use on large sheets of steel, the Handlshear provides a safety factor in that both hands are above the work in operating the tool.

#### Bradford "Kool Grip" Portable Disc Sander and Polisher

The Bradford Machine Tool Co., Cincinnati, Ohio, announces the addition to its line of "Metalmaster" portable electric tools of a portable disc sander and polisher to be known as "Kool Grip." The tool utilizes a unique design for cooling the motor and tool grip. A baffled air intake through the rear handle is said to assure a large volume of clean, cool air over the motor, with the air being directed away from the operator. At the same time, the air intake is said to keep the handle cool and provide the operator with a comfortable grip on the tool. The top plate on the air conditioned handle is



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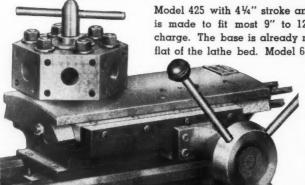
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Bradford "Kool Grip" Portable Disc Sander and Polisher

removable for cleaning air baffles to restore the unit to new tool condition.

The use of double reduction gears allows for a small spindle gear and reduces centrifugal force to a minimum. As a result, grease is said to cling unusually well to the gears, thus providing a smooth, cool, and quiet operating tool, with minimum maintenance and long tool life. The Gleason cut spiral bevel gears and the helical cut intermediate gears used in the tool are made of chromoly steel which is heat treated for correct hardness. Additional construction features include ball bearings with permanent lubrication, and a slide safety

# MADE FOR YOUR LATHE For 9" to 12" and 12" to 16" lathes.



Model 425 with 44" stroke and 1" tool hole capacity is made to fit most 9" to 12" lathes without extra charge. The base is already machined for the vee or flat of the lathe bed. Model 650 with 61/2" stroke and

11/4" tool hole capacity fits most 12" to 16" lathes. The tool holes. of course, are finish bored after mounting on the lathe. Make a dual purpose machine out of your lathe with a SELF-INDEXING ENCO HEX-TURRET.

Model 425

Write for illustrated folder and prices.

#### MANUFACTURING . COMPANY

Dept. 110 4522-24 Fullerton Ave.

Chicago 39, Illinois

switch which can be easily operated with the thumb, but cannot be accidentally bumped on and off.

The Kool Grip Portable Disc Sander and Polisher is produced in three models; namely, a 7-inch heavy duty sander, 9inch standard duty sander, and 7-inch polisher. Standard equipment includes a 3-conductor cable and plug, detachable side handle, backing pad, three discs for sander, and lamb's wool bonnet for polisher. The standard motor is a universal 110-volt a.c.-d.c. unit. A motor in a 220volt a.c.-d.c. type can also be obtained.

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### Hannifin Improved Hydraulic **Power Unit**

Production of an improved type of standardized hydraulic power unit for



Hannisin Improved Hydraulic Power Unit

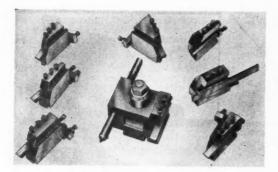
use in conjunction with hydraulic cylinders and other hydraulically operated equipment is announced by the Hannifin Corp., 1101 S. Kilbourn Ave., Chicago, Ill. Distinguished outwardly by a streamline appearance and compact arrangement, the unit is said to provide for any required pump capacities from 1 g.p.m. up and for pressures to 2,000 p.s.i. or more.

Standard equipment of the Hannifin Improved Hydraulic Power Unit includes a pump, pressure relief and adjusting valve, flexible pump-motor coupling, and hydraulic pressure gage. Standard mo-

tors are used.







# A. K. Engine Lathe Tool Post

The development of a tool post for engine lathes which permits an unlimited number of machining operations to be performed from one setup has been announced by the A. K. Tool Co., 2029 Blake Ave., Los Angeles 26, Calif. Said to be ideal for both production and non-production lathe work, the rapid change tool post is recommended as a permanent fixture for lathes.

Offering extreme rigidity, the A. K. Engine Lathe Tool Post is said to hold tool

Illustration showing A. K. Engine Lathe Tool Post together with various toolholders

bits in an absolutely parallel position at all times, thus making it adaptable for use with carbide tool bits. Tool overhang is said to be reduced to a minimum, and tool height adjustment is described as fast and simple. Each toolholder is equipped with a "stop" which makes adjustment indepedent of other tools in the setup. As

a result, a variety of diameters can be cut from one dial setting. According to the manufacturer, one or more tools can be replaced or readjusted after grinding without affecting the setting of the other tools.

Made completely of cold finished steel and case-hardened throughout to provide for long service, the A. K. Engine Lathe Tool Post is available in a range of sizes to fit lathes of 9 to 24-inch swing. Toolholders are produced in sizes to accommodate tool bits from ¼ to 1¼ inches.

# ONE WAY...To Increase Production With New (or Old) Machinery

SELECT-O-SPEED Speeds up to 10 to 1 ratio, from fractional to 7½ h.p. Lever, hand wheel, or electric motorized control.



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50,000 users have found the IDEAL answer to adjusting machinery speed for different sizes and types of metal. There is an IDEAL Speed Control for every requirement of metal working equipment. Easily installed in line drive of old or new equipment. Also, Variable Speed Pulleys, Wide V-Belt Sheaves, Wide V-Belts, Adjustable Motor Bases.

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Mfrs. of Lovejoy Flexible Couplings

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# Acromark Improved "Bull Dog" Marking Machine

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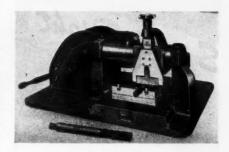
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According to an announcement made by The Acromark Co., 9 Morrell St., Elizabeth, N. J., the small snub-nosed "Bull Dog" Marking Machine made by this firm has been supplanted by a much larger machine having all the advantages of the original product plus greater size, sturdiness, and capacity. The uprights of the frame have been increased from 6 to 10 inches, and their total height including the base is now 12 inches. The overall height of the machine is 15½ inches.

On the work table, which is 10½ x 8% inches in size, an adjustable divided flat block is mounted and stop and start bars for use in rolling a mark into rounds with a flat die. The die holder incorporates a yoke which is said to increase the sturdiness of the die and, by its construction with adjustment screws at each side of the yoke, permits precise adjustment of marking depth over the entire marking area.

The Acromark Improved Bull Dog Marking Machine is provided with an opening of  $12 \times 5$  inches to the die holding slide and an up and down adjustment of the die holding slide of 2 inches. The



Acromark Improved "Bull Dog" Marking Machine

length of the marking stroke is 5 inches. The machine is equipped with a geared motor set for a marking speed of 57 strokes per minute. Units with other speeds can be obtained on order.

A hand lever located at the left of the machine is used to operate the clutch, an arrangement which is said to afford the operator full and constant control of the marking head without stopping the motor. The complete machine with ½ h.p., 220/440-volt, 2-phase, a.c. motor, drive,

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# STYLE 200 STRAIGHT SIDE SHOP BOX

A straight side shop box with drop handle each end. Excellent for shop use where stacking feature is not required.

# IMMEDIATE SHIPMENT

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No. 202—8"x12"x4" 20 Ga. Plain Steel, 72c ea. Baked Green Finish 84c

No. 203—9"x13½"x4½" 19 Ga. Plain Steel, 90c ea.

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and clutch is mounted on a %-inch steel base of 30 x 24 inches, suitable for bench or truck mounting. A cast iron pedestal type base is available if desired.

#### Natco E9 "Holeunit" Deep Hole Driller

Designated as the Natco E9 "Holeunit," a horizontal deep hole drilling machine which is so constructed that standard two-lip twist drills or single-lip gun drills can be used to excellent advantage has been developed by the National Automatic Tool Co., Inc., Dept. 27, Richmond, Ind. Deep oil passage and lightening holes not requiring accuracy of runout or



Natco E9 "Holeunit" Deep Hole Driller

smooth finishes can be drilled with standard two-lip twist drills at conventional speeds and feeds. Both the drill and the work are revolved, and a step feed cycle is employed. In step drilling, the chips are removed by frequent withdrawal of the drill. Size permitting, oil passage drills are used, and lubricant at high pressure is supplied to the drill points.

Deep holes requiring smooth finishes and minimum runout can be drilled with single-lip gun drills at speeds higher and feeds lower than conventional for twist drills. In this case, only the work is revolved, and a continuous feed is employed. High pressure lubricant forced through the center of the drill provides lubrication at the cutting point and washes the chips back through the chip grooves to avoid congestion. Deep holes requiring a reaming operation can be reamed with a standard reamer. Only the reamer is revolved and a continuous feed is employed.

The Natco E 9 Holeunit Deep Hole Driller is so arranged that the functions required for performing the above deOrlandi Improved Gear Checker set up for checking the helix angle of a gèar

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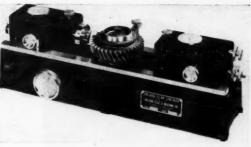
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ns escribed machining methods can be readily obtained; that is, both the drill and the work can be revolved, only the work revolved, or only the drill revolved. The right-hand head of the machine is a standard Natco E9 Holeunit equipped with a quick speed change gear driven drill spindle and hydraulic feed

arranged for either step drilling or continuous drilling cycles. The left-hand head is a work spindle head which can be either locked stationary or revolved. When revolved, the spindle is driven by an electronically controlled variable speed motor adjustable through a wide

range of speeds.

According to the manufacturer, the combination of the right and left-hand head is so flexible that the style of drilling, correct speeds and feed cycle can be readily selected. A master control station provides centralized operator control and selector switch control for setup and cycle selections.



# Orlandi Improved Gear Checker

The Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich., announces that it is now distributing the Orlandi Gear Checker made by the Orlandi Gear and Machine Co., Detroit. As a result of an improved design, the gear checker can now be used for the fast checking of helix angle. A visual check of helix angle is made possible by the use of a simple movable and adjustable head which enables the operator to perform the operation as rapidly as one gear can be lifted and another placed on the resting plate and lo-

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Close-up view of Orlandi Improved Gear Checker showing helix angle adaptar being set up by the use of gage blocks

cating pin of the gear checker.

With the Orlandi Improved Gear Checker, even inexperienced operators can, it is claimed, check pitch diameter, concen-

tricity, size, tooth spacing, backlash, and parallelism of spur, helical, and worm gears. Moreover, the unit can be used for the three-wire checking of thread forms with unusual accuracy and production speed.

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# Landis Tool Vibration Type Loading Device

Developed for use with the company's centerless and centerless thread grinder, the Landis Tool Vibration Type Loading Device illustrated herewith, product of the Landis Tool Co., Waynesboro, Pa., utilizes vibration for aligning screw blanks or similar parts and introducing them into the machine. There are no mechanically moving parts other than those for set-up adjustment. Thus, wear, due to friction, is confined solely to the contact surface between the blanks and the hopper.

The action of the blanks in the hopper is unique in that they move up a circular, inclined ramp on the inside face of the hopper wall until they enter the feed tube at the top of the hopper. The purpose in elevating the screws in this man-



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 Special high speed circular, dovetail, flat form and special tool bits.
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ner is twofold. First, since the ramp extends around the inside of the hopper for one and one-half turns, the relatively long path of travel aids in aligning the blanks before they enter the feed tube. Blanks lying crosswise on the ramp are forced off by vibration and overbalance, while the ones standing up are pushed off by a projecting deflector. Secondly, the blanks which are not aligned can fall back into the hopper without slowing up or interfering with the smooth flow of the blanks toward the feed tube.

The clockwise movement of the blanks in the hopper is obtained through directional vibration by utilizing one-half of the sine wave of alternating current through rectification. Since the feed tube is essentially horizontal, the blanks are fed through this rectilinear vibration, stemming from the primary source. The rheostat knob on the front panel provides a convenient means for adjusting the rate of feed from a creep to full speed.

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The loader is designed to readily handle blanks which are equal in length and diameter. A small agitating platform or pan, with a hole in one corner, receives the blanks from the ramp. Because of the manner of securing this pan to the hopper, enough extra vibration is induced



Landis Tool Vibration Type Loading Device

to cause the blanks to dance or bounce across the hole in the floor of the pan. This hole is a trifle larger than the diameter of the blank, but not large enough

# A LIGHTWEIGHT, PORTABLE SANDER & POLISHER

The day of laborious hand sanding or buffing is gone. Now you can easily and speedily do those jobs heretofore sidestepped because you considered mechanical sanders too heavy or expensive for practical use.

The Clarke DUO sander and polisher meets a long-felt need. It weighs but 4 lbs.; works on AC or DC; can be used on metal, wood, or plastics; has 10-ft. rubbercovered cord.

Sold complete with 5'' rubber disc at \$36.50 F.O.B. Detroit.

Accessories available: 3" and 5" sanding discs (fine, medium, coarse), 5" lamb's wool buffer, 3" rubber disc. Dealer inquiries invited.

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to permit the blank to pass through crosswise. If the blank hits the hole crosswise, it quickly bounces to an upright position and enters the hole. The feed tube, in this case, curves up under the hole and, as soon as the blank goes through the hole in the pan, it enters the tube. Since one side of the pan is open to the hopper, jamming is said to be eliminated.

Four hoppers, each handling three sizes of blanks, cover a range of work sizes up to %-inch diameter. Removal of only two screws facilitates changing of hoppers, and loosening two screws permits changing the feed tube. The mounting bracket has adequate adjustments for aligning the feed tube with the grinding throat, as well as for permitting the loader to be pivoted away from the machine. According to the manufacturer, the full productive output of the machine is assured with the loader since the operator does not influence continuous work flow, once the ideal rate is established.

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#### Super Offset Ejector Toolholder

As an addition to its line of ejector type straight toolholders, the Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich., announces an offset ejector toolholder which is said to offer all the advantages in economy of the straight ejector tool-



Super Offset Ejector Toolholder

holder plus the ability to perform hardto-reach facing and boring operations.

According to the manufacturer, the Super Offset Ejector Toolholder is designed to hold an insert of solid carbide without clamping strains and to allow the chips freedom from interference with the clamping mechanism. Due to the compound angle at which the solid carbide insert is held in the holder, the maximum economy in regrinds is said to be achieved without the grinding wheel ever coming into contact with the steel holder.

# eisen

# Sauereisen **Acid Proof Cement No. 31**

A quick setting, self-hardening white cement which is applied cold. Will resist water, oil, electricity, most solvents, acids and temperatures to 2000° F Used with acid proof brick in the construction of pickling tanks, pits, sewers, floors and chimneys.

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Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S. Inexpensive Last for years. Write for Circular.

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Dealers Wanted Rated 10 amp., 125 volts - 5 amp., 250 volts Silver contacts

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Model 101 normally open. Current on when pedal is depressed. Model 102 normally closed. Current off when pedal is depressed.

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Logan 9-Inch Bench Lathe

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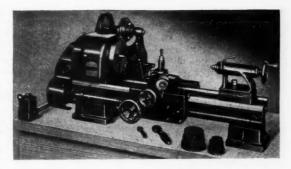
#### Logan 9-Inch Bench Lathe

A 9-inch bench lathe having the same basic design features that characterize larger lathes of the company's line is now in production at the Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill. With a 9-inch swing and 18 inches between centers, the machine is said to be par-

ticularly adaptable to precision manufacturing operations, general machine shop and toolroom work, automobile and appliance repair. Its compact size is claimed to make the lathe especially well

adapted to home workshops.

The Logan 9-Inch Bench Lathe has a ball bearing spindle mounting, particularly designed for high speed operation. The two V-ways and two flat ways of the bed are precision ground to within 0.0005 inch of parallelism. Massive construction is said to ensure steadiness on heavy cuts, as well as durability. Self-lubricat-



ing bronze bearings are provided for protecting vital wear points.

## "Plastic-Seal" Protective Coating

"Plastic-Seal," a plastic dip coating resulting from refinements in the basic formula of ethyl cellulose compounds used during the war for protecting vital surfaces against corrosion, rust, and physical damage, is now being marketed by the Plastic-Seal Div., Globe Imperial



Just slip these attachments into the spindles of your drill presses and you're all set. It's the lowest cost way to tool up for regular tapping production or for extra tapping capacity. And the quality of tapping you get will satisfy all usual requirements.

BULLETIN No. 2 gives details of the exclusive features that give Ettco-Emrick Attachments their hairtrigger sensitivity, precision and long life. Write for a copy today.

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7 SIZES For No. 0 to 1" Taps



Illustration showing typical metal parts to which "Plastic-Seal" Protective Coating has been applied.

Corp., 2034 Kishwaukee, St., Rockford, Ill. According to the manufacturer, the principle advantages realized from these refinements are controlled variable thickness of the coating from 0.045 to 0.06 inch; controlled exudation of the coating; and the use of red, green, and blue colors in addition to water clear coating. The coating can be quickly and easily

applied by dipping the object into molten Plastic-Seal ranging in temperature from 350 to 370 deg. F. Upon removal from the material, the mass of the object absorbs the heat, leaving a smooth, tough, pliable, transparent coating which permits easy handling, storing, and identification. Due to the tough protective skin formed over the part, Plastic-Seal is said to be ideal for storing, protecting, or shipping parts having highly finished precision surfaces, such as bearings, threaded parts, plug gages, and cutting tools. It is claimed to be particularly adaptable to the protection of highly finished, accurately machined surfaces during assembly operations.

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In connection with the marketing of Plastic-Seal, the company is equipped to offer a complete packaging service. Dipping tanks can be built ranging from bench types to those with 1,000-lb. capacity to meet a wide variety of production requirements. Outstanding features of the Plastic-Seal tanks include thermostatic temperature control through dial selectors, a preheat compartment equipped with a mechanical agitator, and a heat dispersal unit in the dipping compartment for fast melting of the plastic.

The company also offers engineering



358

services for setting up conveyor systems to move parts through the packaging process in an efficient and orderly manner. These conveyor systems are built and designed to fit the particular problem, space, and personnel requirements in the individual plant.

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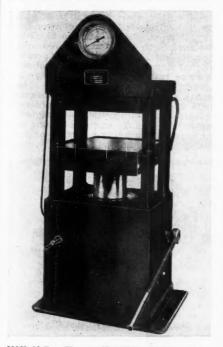
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M&N 30-Ton Electric Hot Plate Molding Press

As an addition to its line of hydraulic presses, the M&N Machine Tool Works Inc., 144 Orono St., Clifton, N. J., announces a 30-ton electric hot plate moldant



M&N 30-Ton Electric Hot Plate Molding Press

ing press which is especially designed for the rubber and plastics industries where speed and ease of operation is essential to economical production, as well as for laboratory uses. The press can be obtained with any desired amount of openings and with steam platens on order. Larger platens and motor-driven hydraulic power units are also available.

Outstanding features of the M&N 30-

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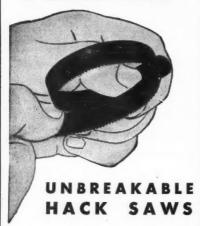
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# Spartan METAL CUTTING SAWS

## **FLEXARD**



Spartan Flexard Hand Hack Saw Blades are ideal for use in repair and maintenance work, for they will not break in use and yet they will out-cut ordinary standard blades 3 to 1.

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Spartan Saw Works
Springfield 7, MASS.

Ton Electric Hot Plate Molding Press include a visual temperature indicator; electrically heated and thermostatically controlled platens; double-acting hand pump; compact all-steel construction; and large platen area. Specifications of the unit are as follows: size of base, 16 x 12 inches; overall height, 42 inches; platen size, 12 x 12 inches; capacity, 30 tons; daylight opening, 10 inches; stroke, 6 inches; ram diameter, 5 inches; and approximate weight, 400 pounds.

#### Hall 3-Inch Capacity Collet Chuck

A 3-inch diameter capacity collet chuck for production operations has been introduced by the Hall Manufacturing Co., 622 Tularosa Dr., Los Angeles 26, Calif. Designed for 8-inch American A-1 spindle nose lathes, the chuck can be operated without stopping the machine, is not sensitive to variations in stock size, is easily adapted to operate expanding arbor collets, and eliminates all lathes, fingers, cams, dogs, or ball locks, the manufacturer states. In addition, the operating lever can be set at any convenient angle for the operator, including a vertical or horizontal angle or any angle in between.



Hall 3-Inch Capacity Collet Chuck

According to the manufacturer, the Hall 3-Inch Capacity Collet Chuck is unique in that it closes the specially slotted collet so that the grip on the stock is parallel, thus providing a 3-inch long bearing on the stock. As shown in the accompanying illustration, both 3 and 6-inch collets are available for the chuck, which is said to operate coolly. All parts except the operating lever turn at spindle speed, thus elminating friction and heat. The operating lever is connected to the chuck with floating bronze shoes.





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now available, specifications, prices and other pertinent data. You'll be able to select the equipment you need from inventories located in Boston, Chicago, Cincinnati, Cleveland, Los Angeles, New York, Philadelphia, Richmond, and San Francisco... and do it right in your own locality.

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New Shop Literature

"Injury in Ground Surfaces," Part IV provides the lead feature in Volume 38, No. 4 of "Grits and Grinds," publication of the Norton Co., Worcester 6, Mass. The article discusses the nature of burn, effect of burn on hardness, detection of burn by etching, and the meaning of injury in ground surfaces. The booklet also includes an article entitled "Sharpening Gear Shaper Cutters to a 2 Microinch Finish," as well as information on the new Norton pricing program. Copy free upon request.

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For use on all machines with T-slots.

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DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD Your business letterhead will bring literature. WATTS BROS. TOOL WORKS Wilmerding, Pa. "Enlist in World Progress" is the title of a 16-page catalog now being issued by the Canedy-Otto Manufacturing Co., Chicago Heights, Ill., which illustrate and describes and provides detailed spectocations on the company's complete drill press line, that includes sliding head floor drills, bench drills, radial drills, single and multiple-spindle bench and floor drills, and so on. Copy is available free by requesting Insert No. 90.

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Besly-Titan Abrasive Wheels are featured in a 48-page pocket-size handbook published by Charles H. Besly & Co., 118-124 N. Clinton St., Chicago 6, Ill. The booklet explains the advantages of Steelbac grinding discs, a bolted-on pro-Reasons for perforations in the discs are clearly outlined and a full explanation for use of resinoid bond is given. Following this section is a standard marking system chart for Besly-Titan abrasive wheels and a series of price list tables. Other informative subjects covered include (1) types of grain used in making these abrasive wheels, (2) porosity control, and (3) types and uses of coolants.

The concluding section of the booklet includes photographs and descriptions of five wet Besly grinders, two dry grinders, and a piston ring finishing machine. Included among the wet grinders are a 23-inch and a 30-inch double wet grinder, a vertical spindle wet grinder, a single spindle wet grinder, and two models of a double spindle wet grinder, one for grinding circular saws and clutch discs and the other for grinding the ends of universal joint crosses. Included among the dry grinders are a double vertical spindle dry spring grinder and a single spindle semi-automatic grinder. Also illustrated is a vertical spindle piston ring finishing machine. Copy free upon request.

. . for more than 1001 odd jobs



The Hjorth Bench Lathe has the speed, accuracy, handling ease, and dependability that appeals to every operator. That's why you'll find the better shops equipping with the Hjorth Lathe.

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WRITE TODAY FOR DATA AND PRICES.

HJORTH LATHE & TOOL CO. • 8 BEACON ST., WOBURN, MASS.

Supplement to Carboloy Tool Catalog. A 16-page supplement to its general tool catalog listing new products, specifications, and price changes has been issued by the Carboloy Co., Inc., 11143 E. Eight Mile Ave., Detroit 32, Mich. Designed for insertion in the general tool catalog, the supplement also contains reproductions of several other recently issued supplements to the general tool catalog.

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Included in the new products listed is the expanded line of solid Carboloy boring tools and the new standard line of solid Carboloy boring bars. Other new products listed in Supplement GT-199 include random lengths of solid unground Carboloy rod in stock diameters ranging from d to % inch; solid carbide face mill blades ground on three sides ready to use, in two grades and three sizes; and solid ground Carboloy balls; standard in Grade 44A and in 10 sizes from 1/8 to 1inch diameter.

Certain products already announced but not previously listed in the general Carboloy Tool Catalog are included in the supplement for convenience. Specifications and prices are thus listed for the square and round standard tipped boring tools carried in stock; the standard casehardened steel holder for use with Carboloy diamond impregnated grinding wheel dressers; and carbide blanks for threading tools, standard for four tool sizes ranging from % to % inch. Copy of Supplement GT-199 free upon request.

Conco Materials Handling Equipment. The Conco Engineering Works, Mendota, Ill., has released an eight-page catalog illustrating and describing in detail its complete line of hand-powered and electric cranes, hoists, and trolleys. Copy of Catalog No. 3000 free upon request.

#### GEM MACHINE VISES For TOOL-ROOM or Production.



Six sizes, 3" to 12". Many exclusive features. You see them everywhere. Write for circular.

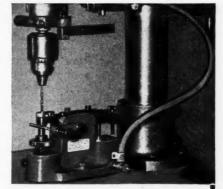
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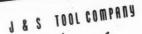
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"Toolroom Work and Small Lots Precision Finished by Heald" is the title of a 44-page bulletin published by The Heald Machine Co., Worcester 6, Mass. The bulletin illustrates and discusses the use of Heald Precision Bore-Matics and Grinding Machines for grinding cutters, saws, chuck bodies, circular knives, and so on; aircraft maintenance grinding; grinding in railroad repair shops; gear grinding; grinding cylinder barrels, die inserts, hub cap dies, tools, gages, and other equipment. Useful chucks and faceplates for the toolroom and small shop are illustrated and described, as well as various other attachments for Heald machines. Simple setups on a Heald No. 48-A Bore-Matic and 49 Universal are pictured and explained. Considerable other information on Heald machines is also contained in the bulletin, copy of which is available free to mechanical executives requesting Bulletin 1-14.



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Progressive Standard Pedestal Spot Welders. A two-color technical bulletin descriptive of its line of standard pedestal spot welders that are said to be equally adaptable to miscellaneous spot welding and for high production work has been released by the Progressive Welder Co., 3050 E. Outer Dr., Detroit 12, Mich. The bulletin provides complete specifications, drawings, and details, as well as general illustrations, of the different sizes and throat depths in which the ma-Copy of Bulletin chines are available. No. 503 free upon request.

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Bellows Foto Facts File Sheets. second in a series of Foto Facts File sheets has been released by The Bellows Co., 798 N. Main St., Akron, Ohio. The sheets describe in detail applications of Bellows "Controlled-Air" equipment in various operations-applications that can be easily duplicated in other plants.

Copies free upon request.

M. R. E. Profile Turning Box for capstan and automatic lathes is fully illustrated and described as to construction features, available models, operation, installation, applications, and so on, in an eight-page bulletin now available free from the Accreylon Co., Inc., 130 W. 42nd St., New York 18, New York.

Bridgeport Grinding Machinery and Grinding Wheels. A 16-page general cat-alog published by The Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn., contains illustrations and descriptions of various designs of horizontal face grinders, vertical surface grinders, knife grinders, buffing lathes, cut-off machines, cutlery grinders, and grinding wheels. Copy of Catalog 147 free upon request.

Natco A - 33 Light Sensitive Multi-Driller or Tapper, product of the National Automatic Tool Co., Inc., Dept. 27, Richmond, Ind., is the subject of an eight page bulletin published by this firm. The bulletin illustrates and describes the three feed arrangements in which the machine is available: namely, hand and foot feed or combination hand and foot feed and air-oil feed, as well as air feed. Specifications and dimensions of the various models are included. Copy of Bulletin 247 free upon request.



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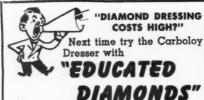
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"American Air Filters in Industry," a 23-page illustrated booklet compiled by the American Air Filter Co., 215 Central Ave., Louisville 8, Ky., discusses various types of industrial dust problems and typical applications of AAF air filters to such problems. Included in the booklet are a chart of size and characteristics of air-borne solids and sections dealing with atmospheric dust and filtered air for industrial air conditioning, industrial ventilation, drying operations, product finishing, control of bacteria and mold spores, cooling electrical equipment, engines and compressors, and miscellaneous industrial applications. Copy free upon request.

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Lempco Ball Action "Di-Ali-Ners." A four-page folder published by Lempco Products, Inc., 5711 Dunham Rd., Bedford, Ohio, illustrates and describes Lempco "Di-Ali-Ners," matched spherical plates (one concave and the other convex) which are designed to eliminate misalignment in punch press equipment. Directions for using the Di-Ali-Ners, as well as prices of the various sizes in which the plate set is available, are included in the folder. Copy free.



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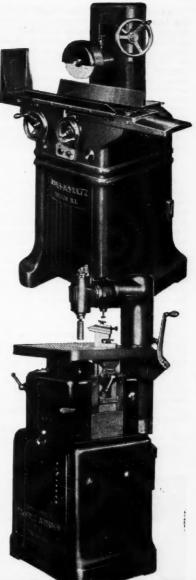
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Norton Grinding Wheels for foundries, steel mills, forge and welding shops are featured in a 32-page pocket-size booklet published by the Norton Co., Worcester 6, Mass. The booklet provides illustrated, descriptive, and tabular information on wheels for portable and disc grinders, mounted points and mounted wheels, cut-off wheels, core files, rubbing bricks, grinding wheel dressers, and other products. Data on abrasives, bonds, wheel marking, specifications, speeds, and so on, are included. Copy free upon request.

Philips Reprint Literature. The North American Philips Co., Inc., 140 E. 42nd St., New York 17, N. Y., now has available a series of four leaflets entitled "Slide Film Explains Ray Diffraction;" "Universal Life Test Equipment for Cathode Ray Tubes;" "Quality Control, Setting Up a Typical Case;" and "Technical Publicity Offers Bright Future for Engineers."

All leaflets are reprints of illustrated articles which have appeared recently in trade magazines. Copies are available free upon request.

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"Punch Pointers" is the title of a 16page pocket-size booklet announced by the Allied Products Corp., Richard Brothers Div., 4640 Lawton Ave., Detroit 8, Mich. The booklet is written as a simple concise reminder of the "do's and dont's" that have an important bearing on proper punch press setup and operation and the proper care and use of R-B Interchangeable Punches and Dies. It is illustrated in an interesting cartoon style, and the text is brief and easy to understand. Copy free upon request.

Weldex Welders. Weldex, Inc., Dept. K, 7327 MacDonald Ave., Detroit 10, Mich., has issued an attractive and informative 10-page catalog describing its complete line of bench and floor model light gauge resistance welders from 1 to 7½ kva. Interesting features comprise three pages of illustrations of typical applications, including several unusual examples of projection and spot welding from wire of 0.004-inch diameter up to 14 gauge cold rolled sheet. Copy free upon request.

Grobet Precision Swiss Files. A 24-page pocket-size catalog released by the Grobet File Company of America, Inc., 421 Canal St., New York 13, N. Y., lists 3,506 different patterns, sizes, and cuts of hand and machine files and rifflers, not counting Grobet rotary and deburring files and Grobet countersinks which are also described. A great many of the different styles of Swiss hand files are illustrated, thus allowing the reader to readily select the style, pattern, size, and cut desired for his purpose.

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21/32"	15	12	8.00	31/32"	15	12	14.00
11/16"	15	12	8.25	1"	20	15	16.00
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Hanna Valves. An eight-page bulletin published by the Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill., presents specifications and operating data on all Hanna Valves, which include footoperated and hand-operated valves for air and hydraulic lines and speed control valves for use with air and hydraulic cylinders. Copy of Bulletin No. 235 free.

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The Procunier foot-operated mechanism is also featured, with clear, easy-to-understand phantom drawings provided to explain its operation and advantages. Large illustrations and complete specifications regarding Procunier sensitive high speed tapping heads round out the bulletin, copy of which is available free

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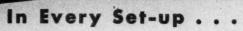
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#### Over the Editor's Desk

THE 1947 Machine Tool Show—the greatest industrial exhibit ever held—has ended. Here were assembled \$16,000,000 worth of machine tools, all different, and each designed to do a specific job with greater speed, accuracy and precision than it had ever been done before. The men who were fortunate enough to see the show received an education in modern American tool engineering.

The show itself was marvelous, but the one thing that intrigued our fancy more than the intricate designs of the machines was the interest evidenced by industrialists of other nations in this display of Yankee ingenuity. We met and talked with engineers and manufacturers from England, Scotland, France, Italy, Egypt, Czechoslovakia, India, Switzerland, China, Spain, Central and South America, Canada and Mexico. These men were there with one purpose in mind and one only—to discover what among these products of the American engineers could be best adapted to advance the economies of their various countries; in other words, to increase the production and distribution of modern living accessories among their people and thus increase their prosperity.

For this hour, political issues were forgotten. The visitors' entire attention was focused upon gears, cams, drives, electronic actuating mechanisms, cutting tools and the means by which these members were coordinated to produce the desired results.

What glorious progress the world could make if the leaders of the Earth's nations could forget their petty bickerings and concentrate—as did these engineers and technicians—upon ways and means to make more things at lower costs and thus raise the standards of living in their several and various countries. How much farther ahead the world would be if all of the billions of dollars and millions of lives and tremendous effort that were expended in the recent war could have been devoted to the production of food and clothing and homes and the other necessities which eliminate poverty and make life worth living.

Howard Campbug

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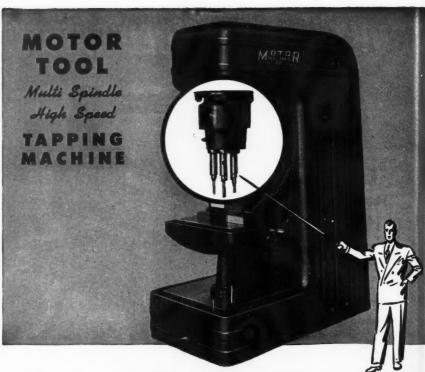
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